Options on Futures

Two types of options

Put

Call

Seller

Buyer

Seller

Buyer

Seller

Buyer

Pour possible positions
Put option

The Buyer pays the premium and has the right, but not the obligation to sell a futures contract at the strike price.

The Seller receives the premium and is obligated to buy a futures contract at the strike price.
Call option

The seller receives the premium but is obligated to sell a futures contract at the strike price.

The buyer pays a premium and has the right, but not the obligation, to buy a futures contract at the strike price.
Seller keeps the premium if damage occurs. The buyer pays for damage if the damage is reimbursed. Premiums paid as price insurance.
Options

Markets. They are different.

Calls and puts are not opposite positions of the same market. Calls can be offset, exercised, or left to expire if the market is above $2.20. The right to sell at $2.20 has no value if the market is below $2.20.

May or may not have value at end.
A range of strike prices available for each contract set by the exchange (CME, CBOT).

Level of price insurance.
For each strike price
- For each contract month
- For puts and calls

Different Premium

is traded in the option market

Premium

through open outcry in the trading pit.
Buyers and sellers establish the premium.
Premium

- Interest Rate
- Time to maturity
- Volatility of underlying futures
- Price of underlying futures contract
- Strike price
- Depends on five variables
Premium Relationship:

Futures Volatility

Strike Price

Increases with the level of protection

Increases with riskiness of the contract
Premium Relationship to:

- Increases as rates increase
- Interest rates
- Reflects carrying charge and risk
- Decreases exponentially as contract expires
- Time to maturity
Premium Relationship to:

Underlying Futures Price

In-the-money

At-the-money

Out-of-the-money
Call: Futures price above strike price
Put: Futures price below strike price
If expired today it has value
In-the-money
At-the-money

If expired today it would break-even

Strike price nearest the futures price
Call: Futures price below strike price
Put: Futures price above strike price
If expired today it does not have value
Out-of-the-money
Option buyer alternatives

- Let option expire
- Exercise right
  - Typically when it has no value
  - Take position in futures market
- Buy or sell at strike price
- Re-sell option rights to another
- Improve basis predictability
- Cash settlement expire with futures
- To futures expiration
- Most options contracts expire 2-3 weeks prior
- Time mis-match
- Remaining value and costs of alternative

Buyer decision depends upon
Option seller

- Now out of market
- Can buy back option to offset position
- Obligated to honor option contract
Put option example

A farmer has corn to sell after harvest.

1) In May, buy a $2.80 Dec Corn Put

Expected minimum price (EMP) = SP + Basis - Prem - Comm

Expected basis = $0.25

Premium = $0.01

Expected basis = $2.39
Net price = Cash + Return - Cost

Option value = $2.25 - 0.30 = $1.95

Cash market = Futures = $2.25

At harvest, futures prices lower.

Put option example: Lower
Put option example

Higher

3) At harvest futures prices higher.

Net price = Cash + Return - Cost

Option value = Futures

$2.90 + 0 - 0.15 - 0.01 = $2.74

$3.15 - $0

$2.90
Call option example

A feedlot wants to buy corn to feed after harvest.

1) In May, buy a $3.00 Dec Corn Call

\[
\text{Expected maximum price (EMP) = SP + Basis + Prem + Comm} \\
\text{Expected basis = } \text{Commission} = \$0.25 \\
\text{SP = } \$0.10 \\
\text{Basis} = \$2.96
\]
$2.46 = $2.25 - 0.01 + 0.20 - Cost
Net price = Cash + Return - Cost

$0 = Option value

$2.25 = Cash market

$2.50 = Futures

At harvest, Futures price lower.
Call option example Higher

3) At harvest futures prices higher:

Option value = $3.15 - $3.00 = $0.15
Cash market = $2.90
Net price = Cash - Return + Cost
= $2.90 - 0.15 + 0.20 + 0.01 = $2.96
Net Price With Options

Buy Call

Buy Put

Cash Price + Premium + Comm

Maximum Price

Cash Price - Premium - Comm

Minimum Price

Cash Price - Premium - Comm