Options on Futures

- Two types of options
- Four possible positions
  - Call Buyer
  - Put Buyer
  - Call Seller
  - Put Seller
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

Strike price.

The seller is obligated to sell a futures contract at the strike price. The seller receives the premium. But it is not the obligation to buy 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.
damages

Seller keeps the premium buy must pay for
for damages
If damage occurs the buyer is reimbursed
Personal warranty protection pays a premium

Options as price insurance
Options

Markets:
The same market. They are different
Calls and puts are not opposite positions or
Can be offset, exercised, or let to expire
Market is above $2.20
The right to sell at $2.20 has no value if the
May or may not have value at end
Strike price

Level of price insurance (CME, CBOT)

A range of strike prices available for each contract
For each strike price
- For each contract month
- For puts and calls
Different premium
through open outcry in the trading pit
Buyers and sellers establish the premium
- Is traded in the option market
Premium
- Interest Rate
- Time to maturity
- Volatility of underlying futures
- Price of underlying futures contract
- Strike price

Premium depends on five variables
Futures volatility
Increases with the level of protection
Strike price
Premium relationship to:
Increases with riskiness of the contract
Premium Relationship to:  
Time to Maturity 
Decreases exponentially as contract expires 
Reflects carrying charge and risk 
Increases as rates increase 
Interest Rates
Premium Relationship:

Out-of-the-money
At-the-money
In-the-money
Underlying Futures Price
Call: Futures price above strike price
Put: Futures price below strike price

If expired today it has value

In-the-money
Strike price nearest the futures price

If expired today it would break even

At-the-money
Call: Futures price below strike price
Put: Futures price above strike price
If expired today it does not have value
Out-of-the-money
Re-sell option rights to another
Buy or sell at strike price
Take position in futures market
Exercise right
Typically when it has no value
Let option expire

Option buyer alternatives
- Improve basis predictability
- Cash settlement expire with futures
- To futures expiration
- Most options contracts expire 2-3 weeks prior
- Time mis-match
- Rebalancing value and costs of alternative

Buyer decision depends upon
Now out of market
Can buy back option to offset position
Obligated to honor option contract
Option seller
Put option example

A farmer has corn to sell after harvest.

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

\[
\text{Expected maximum price (EMP)} = \text{SP + Basis} - \text{Prem} - \text{Comm} = \$2.39
\]

\[
\text{Commission} = \$0.01
\]

\[
\text{Premium} = \$0.15
\]

\[
\text{Expected basis} = \$0.25
\]
Net price = Cash + Return - Cost

Option value = $2.80 - 2.50 = 0.30

Cash market = $2.25

Futures = $2.50

2) At harvest, futures prices lower, put option example lower.
\[ \text{Net Price} = \text{Cash + Return - Cost} \]
\[ \text{Option Value} = \text{Option Value} \]
\[ \text{Cash Market} = \text{Cash Market} \]
\[ \text{Futures} = \text{Futures} \]

\( \begin{align*} \$2.90 & = \$2.74 + 0 - 0.15 - 0.01 \\ \text{Put option example} & \text{Higher} \end{align*} \)

3) At harvest, futures prices higher.
A feedlot wants to buy corn to feed after harvest.

1. In May, buy a 53.00 Dec Corn Call

\[ \text{Expected maximum price (EMP)} = S2.96 \]

\[ \text{Commission} = 80.01 \]

\[ \text{Premium} = 80.20 \]

\[ \text{Expected basis} = -80.25 \]

\[ \text{SP + Basis + Prem + Comm} = \]

Call option example
Net price = Cash - Return + Cost

Option value =  

Cash market =  

Futures =  

2. At harvest Futures prices lower:

Call option example lower
3) At harvest futures prices higher:  
Futures = $3.15  
Cash market = $2.90  
Option value = $3.15 - $0.15  
Net price = Cash - Return + Cost  
= $2.90 - 0.15 + 0.20 + 0.01 = $2.96

Call option example Higher
Net Price with Options

- Cash price + Premium + Comm
- Maximum Price
- Buy Call
- Cash price - Premium - Comm
- Minimum Price
- Buy Put