5. Basics of Futures and Options: Part 2

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Abstract/Summary

Session 2:
Market analysis*: a. Fundamental analysis, b. Technical analysis – charts, terminology, etc.* ***Options:*** *a. Puts and calls, b. Option premium – intrinsic and time value, c. Options for hedging (minimum price contracts).*

Futures & Options Basic Concepts, Part 2

Risk and Profit, August 2013

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What is an option?

- A financial instrument that transfers the right to buy or sell an underlying asset at a specified price.
- For commodity options, the underlying asset is a futures contract.

Two types of option

Call Option

The buyer of a Call has the right to buy futures at the specified strike price

Put Option

The buyer of a Put has the right to sell futures at the specified strike price

These are separate contracts

Strike Prices

- Options are traded for several different strike prices
  - **$6.90** Put on July wheat gives the right to sell July futures **at $6.90**.
  - that's a different option to a **$6.50** Put on July wheat, which gives the right to sell July futures at $6.50.
  - Strike price Increments are typically 10c
    - (5c increments in the nearby)

Option Premium (Price)

Premium = Intrinsic Value + Time Value

Intrinsic value

depends on the difference between the strike price and the futures price (available profit if exercised)

Time value

depends on time remaining, volatility, interest rates

"In" ,"Out of" ,"At" the money

In-the-money

Option has intrinsic value - can exercise at a profit

Call is in the money if **futures > strike**

Put is in the money if **futures < strike**

At-the-money → futures ≈ strike price

Out-of-the-money → **No intrinsic value:**

Call is out of the money if **futures < strike**

Put is out of the money if **futures > strike**

No $$ available from exercising the option

Intrinsic value

Sep13 Corn Options (Futures @ 482'2) (Aug 15, 2013)

Call	Strike Price	Put
16'5	470.0	4'3
13'1	475.0	6'0
10'2	480.0	8'0
7'7	485.0	10'6
6'0	490.0	13'6

$4.70 call is "in-the-money"

Intrinsic value = $4.82¼ - $4.70 = 12¼ c/bu

Using an Option

1. **Exercise it**
   - by taking the futures position at the strike price
2. **Sell it** (before it expires)
   - Selling it captures any time value it might have
   - Exercising the option only captures the intrinsic value
3. **Let it expire** (if worthless)
   - e.g., at expiration, a $6.90 Put is worthless if the futures price is above $6.90

Buying options

- Pay the premium up front.
- No margin calls – no need to maintain a margin account.
- Most you can lose is the upfront price of the option
- Similar to buying insurance

Hedging with Put Options

- Buying put options is like buying insurance against lower prices
  - Pay a premium to protect against possible loss
  - As the futures price falls, put option gains value
  - Once premium is paid – no further obligation
    - No margin calls
  - If futures price does not fall → option expires worthless (like no claim on insurance)

Profit for a Put option buyer

- To make a profit, at expiration, futures must be <u>below</u> the strike by more than the premium
- Example:
  - **<u>July wheat futures at 6.90</u>**
    - Buy a July **7.00** Put for **65 c/bu**
    - In late June, the option will be worth 65 if futures are below the strike price by 65, i.e., at 6.90 – 0.65 = 6.25
    - Futures need to be **<u>< 6.25</u>** to make a profit on the option

Hedging with <u>Futures</u>

- Sell futures
  - If price falls – futures position makes $
  - If price rises – futures position looses $
- Price effectively locked-in (subject to basis risk)
  - **No benefit from a favorable move in cash price**

Options vs Futures hedge

1. With options, hedger can still benefit from a favorable price move
   - Price not locked in
2. No margin calls – for the option buyer
   - The most it can cost is the **premium** - i.e. the up-front cost of the option.

Position Diagrams

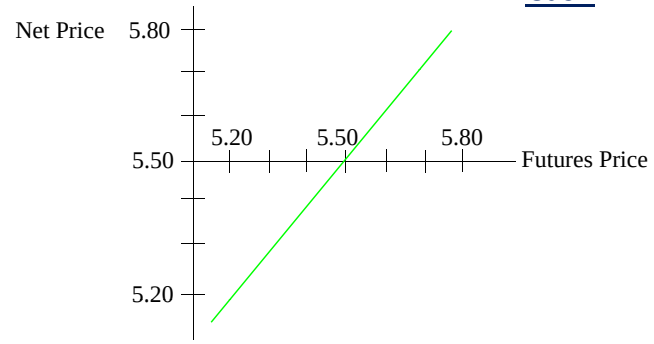
Shows how net realized price (profit) changes as the futures price (at expiration) changes

Vertical axis: net realized price (profit)
Horizontal axis: futures price at expiration

All examples are for Dec. Corn, assuming zero basis, and futures currently at $5.50

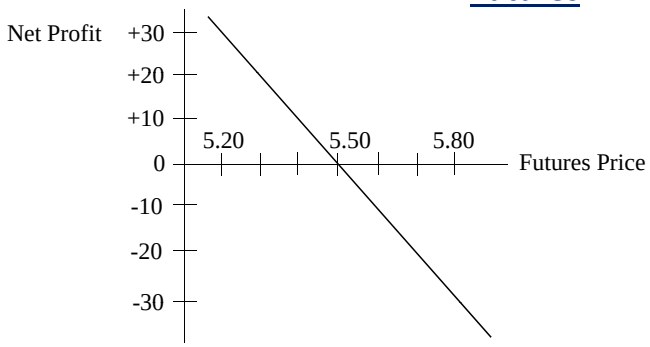
Long Cash

Cash



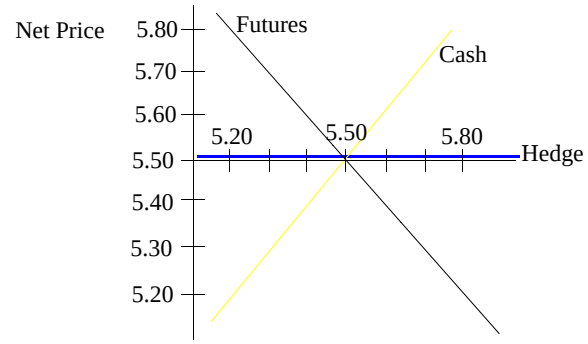
Short Futures @ 5.50

Futures



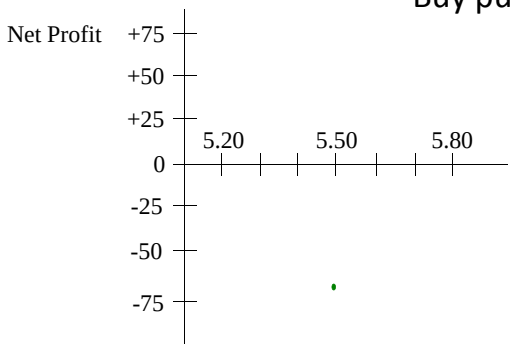
Long Cash + Short Futures @ 5.50

Futures Hedge



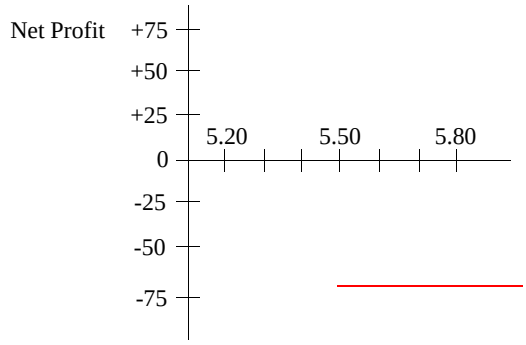
Buy 5.50 Put for 70c/bu

Buy put



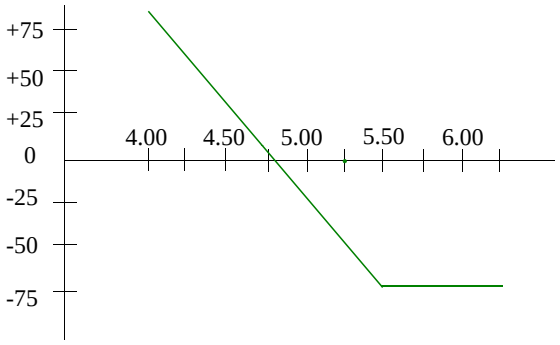
Buy 5.50 Put for 70c

Buy put – price rise



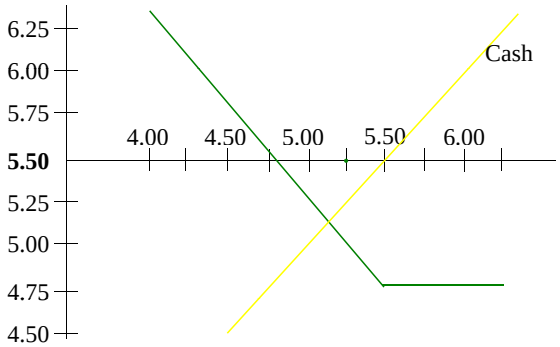
Buy 5.50 Put for 70c

Buy put – price fall



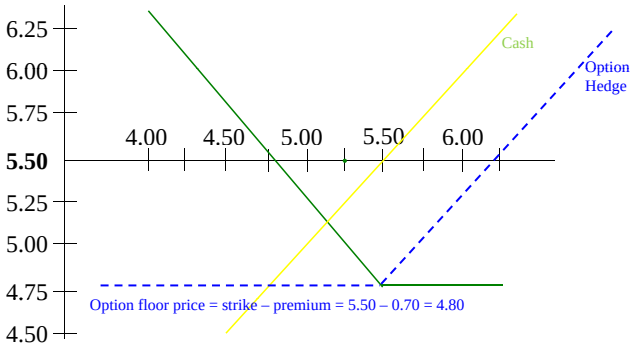
Buy 5.50 Put for 70c

Hedge with 5.50 Put



Buy 5.50 Put for 70c

Hedge with 5.50 Put



Vertical axis shows net price

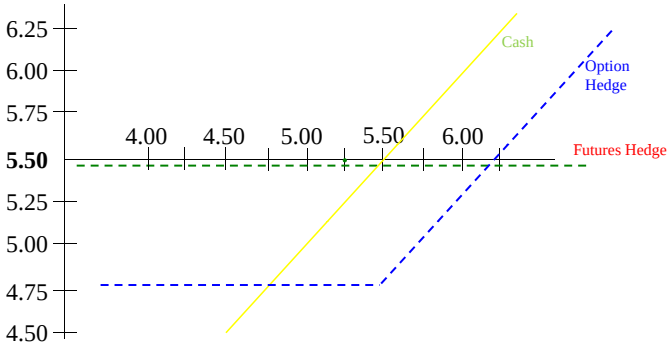
Price Floor (Min Price Contract)

For a short hedger buying put options:

Price Floor = Strike price – Premium + Basis

Buy 5.50 Put for 70c

Cash v Futures v Option



This ignores basis. Negative basis will reduce **all** net prices

Net Price with the Put Option

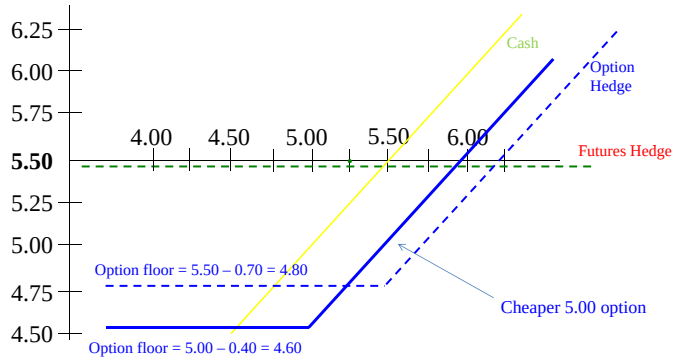
Early Dec: $8.00 put on July wheat costs 60c/bu.

Late June: sell wheat at basis of 20 under; sell option at expiration for intrinsic value.

Find net price if July futures price in late June is:

a) $6.00
b) $7.00
c) $8.00
d) $9.00
e) $10.00

5.50 Put for 70c vs 5.00 Put for 40c **Using a cheaper option**



Cheaper option – like buying less insurance. If you end up not needing it (prices rise) – you're better off.

Which option?

If prices rise – the options expire worthless

→ better off with the cheaper option

If prices fall – the options are profitable

→ more expensive option gives you more price protection, a higher price floor

Option Cost

For 400 acres of corn yielding 150 bu

60,000 bushels → 12 options

$4.60 put on Dec corn @ 25c/bu → $15,000

$7.00 put on July wheat @ 50c/bu

Hedging 50,000 bu → $25,000

Selling options

- **Selling a put**:
  - involves an **obligation** to buy futures at the strike (if the option is exercised)
- **Selling a call**:
  - involves an **obligation** to sell futures at the strike
- risk of loss is similar to a futures position
- option sellers must maintain a margin account.

Elevator min price contract

Forward cash contract plus purchase of a call

Example: Dec at $4.80, and $4.80 call @ 30c/bu

Basis for harvest delivery is -65, Cash bid = $4.15

Min price = $4.15 - $0.30 = **$3.85**

Futures fall to $3.80 → your price is **$3.85** (min)

Futures go to $5.50 → your price is **$4.55**

4.80 call is worth $0.70/bu

Price = $3.85 + $0.70 = $4.55

Min price guaranteed, obligation to deliver

Fundamental Analysis

a) **gathering information** about supply and demand ……

- USDA reports, weather news, political news,
  - Usually in the form of data on *quantities*
  - *especially Ending stock / Use ratios*

b) and translating that *quantity* information into a *price prediction*

which may involve use of regression analysis to estimate relationships between variables

- Is it useful or worthwhile for the small hedger or speculator?

Technical Analysis

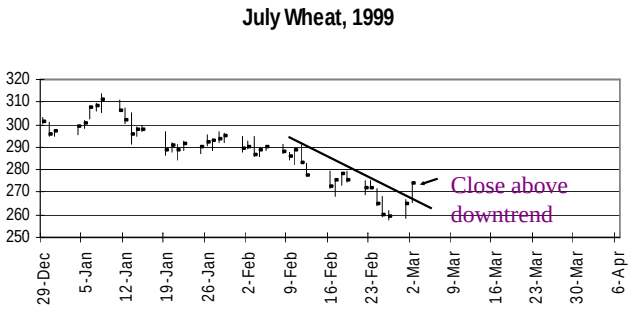
using historical information on prices, patterns, volume of trade, etc, to forecast future price movements ……

- Typically involves:
  - a) Charts
  - b) Other mathematical formulas
    - Moving averages, Relative Strength Index, etc
- Is it useful or worthwhile?

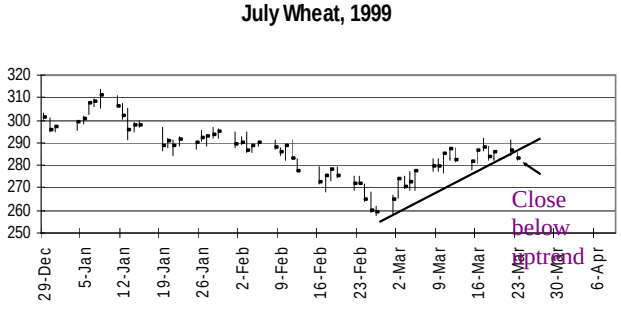
Some chart patterns

- Trends and trend reversals
- Head & Shoulders
- Key reversal

Close above a downtrend



Close below an uptrend



Head & Shoulders: Nov 2008 Soybeans

Key reversals

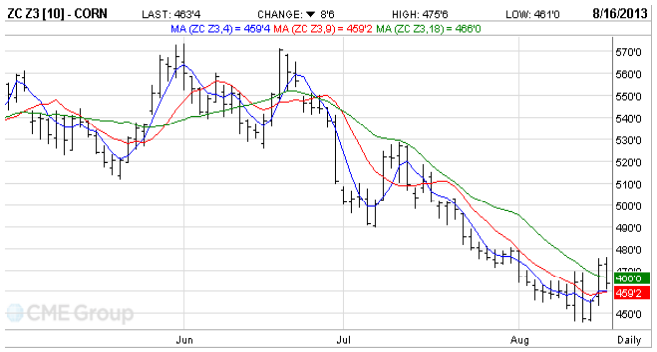
- Key reversal top
  - New high (recent or contract)
  - Outside day
  - Close below previous close --- sell signal
- Key reversal bottom
  - New low
  - Outside day
  - Close above previous close ---- buy signal

Key Reversal – Mon Aug 12, 2013

Moving Averages

- to monitor trends
  - behaves more smoothly than the daily price
  - reveals the trend
- Analysts use two moving averages
  - long (e.g. 18 day) --> reveals trend
  - short (e.g. 5 day) --> reveals change in trend
- Signals occur when lines cross
  - short crosses long moving up --> **buy**
  - short crosses long moving down --> **sell**

Dec'13 Corn – 4,9,18 day mov avgs



Is technical analysis useful?

1. Futures is a **zero sum** game

If buying is such a great idea -- who would sell?

2. Successful "strategies" -- should be **secret**

more profitable to sell the strategy than to use it?

3. Chart patterns **do** repeat - but that does not mean they are useful for prediction.

If patterns were useful, anticipation would destroy them

If not useful - why is it used?

1. Its easy …

   but can be made to appear sophisticated
2. It's a crutch …

   provides a justification for what you did
3. Brokers like it …

   Can result in frequent trading - more commissions
4. It 'works' ---- 50% of the time !

   if price is totally random (i.e., market is efficient), **any** signal has a 50% chance of being correct.

Risks

- of hedging/contracting
  - Crop failure/ Unable to deliver
  - Counterparty risk (elevator)
  - Better price foregone?
  - Margin account risk? (MF Global scenario)
- of <u>not</u> hedging/contracting
  - price