**Options**

option: the right, but not obligation, to buy or sell something under specified terms

call option: option to buy something
put option: option to sell something

underlying: the something (usually some stock)

specified term: usually a specified price and period under which it is valid

strike price - the specified price at which you may buy or sell the underlying

expiration date: last day on which the option is valid

cost

option premium: the cost/price of the option

exercise ("to exercise the option") : following through and buying/selling under the specified terms

American style: option may be exercised at any time up to the expiration date

European style: option may only be exercised on the expiration date

Example: you pay the owner of a house $15k for the option to buy the house for $200k anytime in the next year.

type: American-style call
strike: $200k
expiration date: in year
underlying: the house
premium: $15k
Stock Options

underlying: 100 shares of a stock
usually priced on a per share basis
usually American style

example: GE put options expiring June 19, 2009
with a strike price of $10/share.

Cost/premium: $3.30/share on 3/9/2009
according to Yahoo Finance.

in-at-out-of the money: in the money if it makes
sense to exercise. A call is in-the-money
if the stock price $S$ is greater than the strike
price $K$. A put is in the money if $S < K$

\[ \begin{align*}
S < K & \quad \text{call out of the money} \\
S = K & \quad \text{at the money} \\
S > K & \quad \text{in the money}
\end{align*} \]

"write" an option: to sell an option

complications: dividends, margin requirements for option writing

value of option at expiration

$S$: stock price $K$: strike price

\[ \begin{align*}
P &= \max(0, K - S) \\
C &= \max(0, S - K)
\end{align*} \]
Put - Call Parity

value at expiration

call w/ strike K

\[ \uparrow \]

write put w/ strike K

\[ \uparrow K \]

loan of face value K

maturity at expiration

\[ \uparrow k \]

\[ \Downarrow 1 \text{ stock} \]

\[ \Downarrow S \]

before expiration:

\[ C \] - price/premium of European call expiring at time \( T \)

and with strike \( K \)

\[ P \] - premium of European put expiring at time \( T \)

and with strike \( K \)

\[ K(1+r_f)^{-T} \] - value of risk-free loan paying \( K \) at time \( T \)

\( r_f \) - risk-free rate (e.g. yield of US gov't bonds)

\( S \) - price of the stock

formula:

\[ C - P + K(1+r_f)^{-T} = S \]