Options Fundamentals

Saturday, October 18, 2025 9:50 AM

OPTIONS

Futures = OBLIGATION to buy/sell some security asset underlying at some price at some expiration date

Option = RIGHT, but NOT OBLIGATION (from the buyer's point of view) = = = =

CALL

PUT

	CALL	PUT
option buyer	right to buy	right to sell
option seller	obligation to sell	obligation to buy

} in exchange for a premium (option price, option value)

Analogy:

- CALL option can be viewed as a concert ticket reservation
  pay fee today to secure the right to buy later
- PUT option can be seen as car insurance
  pay premium to the insurance company

EXERCISE STYLES

EUROPEAN

can only be exercised at maturity

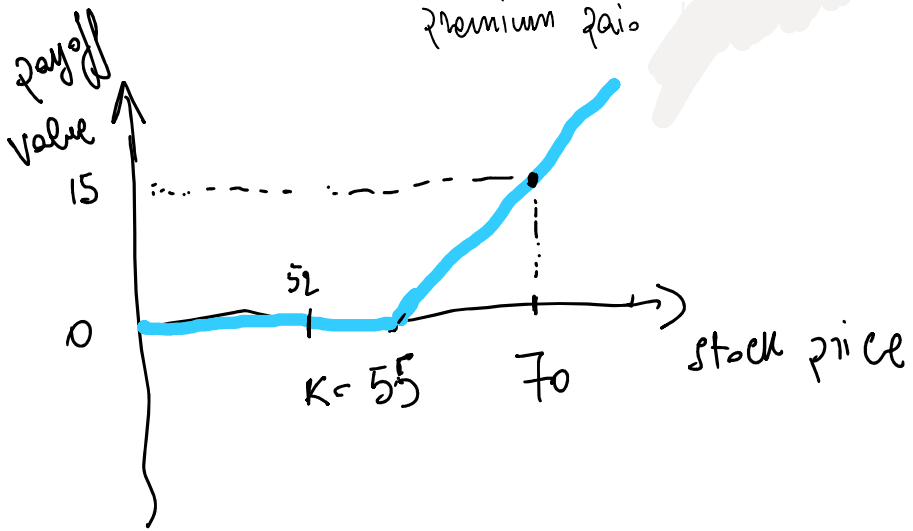
AMERICAN

can be exercised at any time, even before maturity

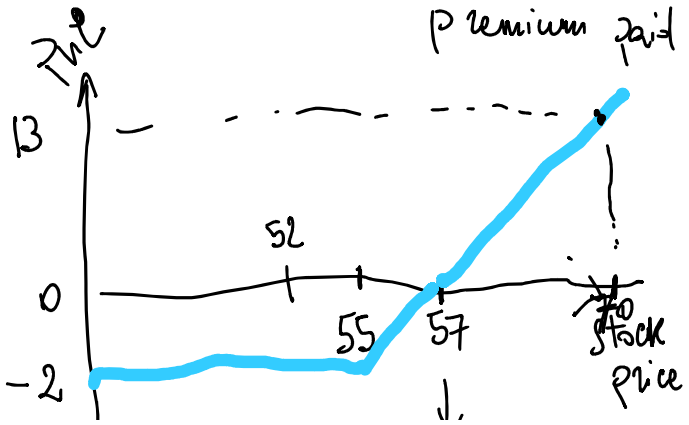
Scenario AT MATURITY

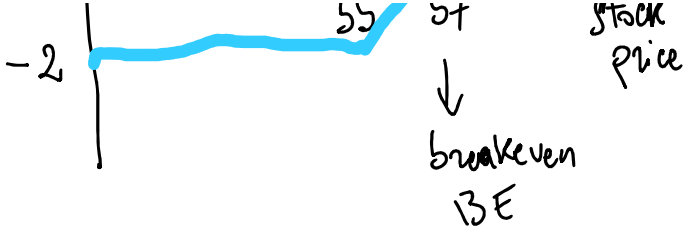
CALL

PAYOFF (option value, without considering premium paid)



PnL (Profit or Loss made by trader, which includes premium paid)



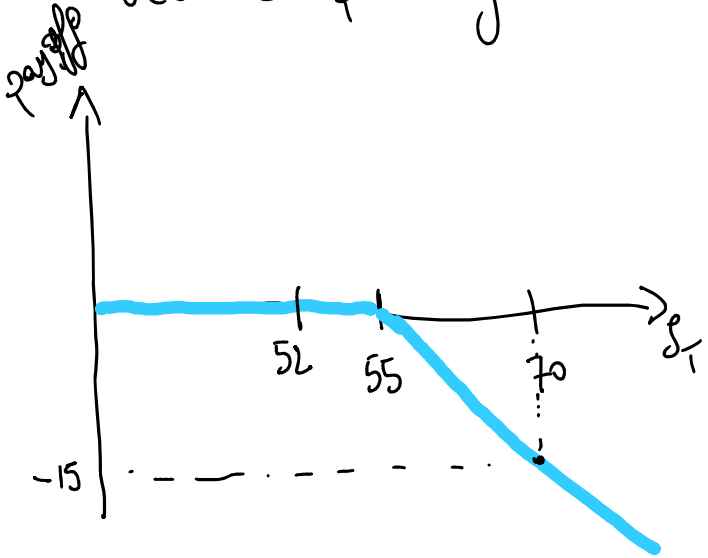


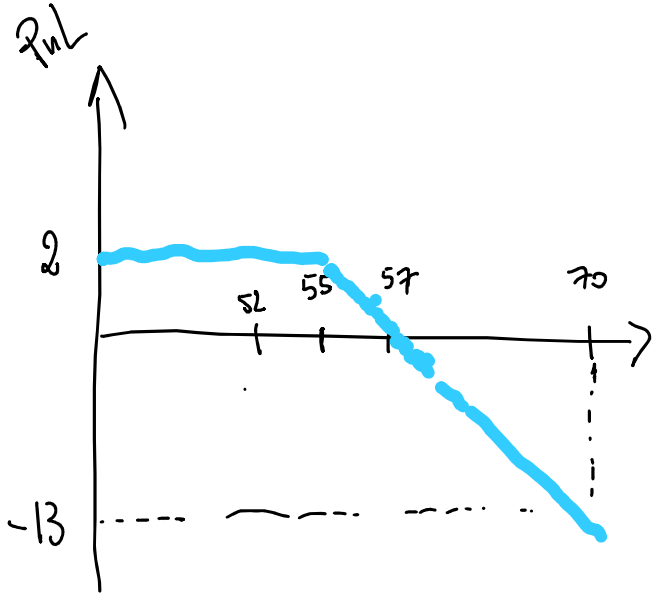
S_0 = stock = 50 $

K = (strike exercise price) = 55 $

C = premium = 2 $

Seller's point of view





$$\begin{cases} 0 & \text{if } S_T \leq K \end{cases}$$

S_T = stock at maturity

$$\text{Value of call} = \begin{cases} 0 & \text{if } S_T \leq K \\ (S_T - K) & \text{if } S_T > K \end{cases}$$

S_T - maturity

K = exercise price (strike)

$$= \max(S_T - K, 0)$$

$$\text{PnL of call} = \max(S_T - K, 0) - C$$

C = call premium

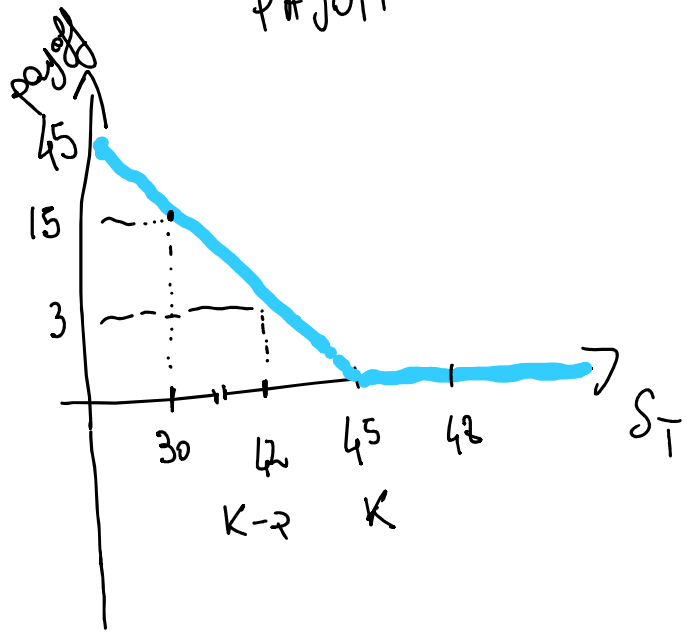
	MAXIMUM GAIN	MAXMUM LOSS
LONG CALL	$+\infty$	premium
SHORT CALL	premium	∞

PUT

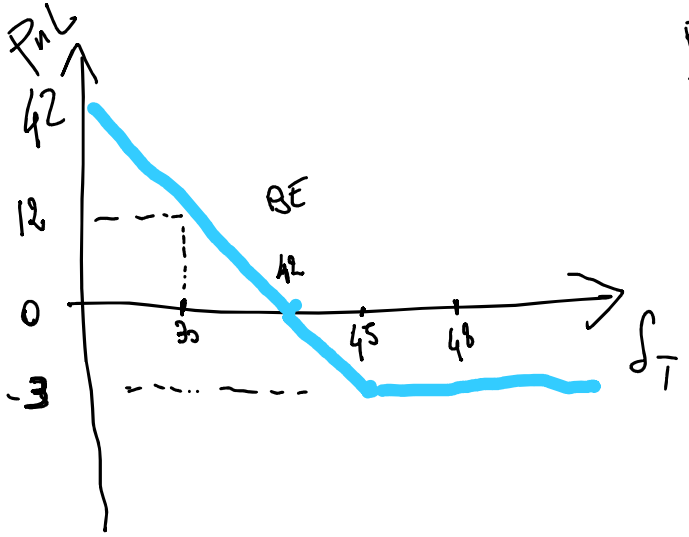
PAYOFF

PnL

PAYOFF

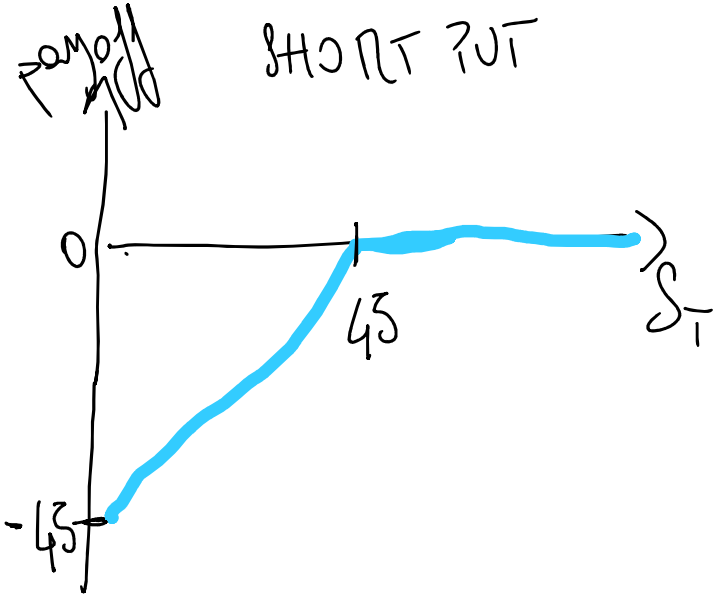


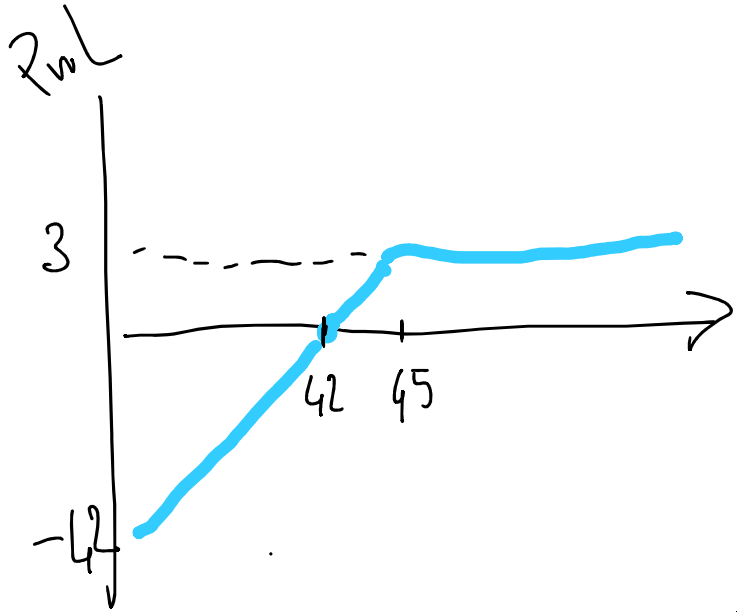
PnL



premium
P = 3 $

SHORT PUT





$$\begin{cases} 0 & \text{if } S_T \geq K \end{cases}$$

$$\text{value of put} = \begin{cases} 0 & \\ K - S_T & \text{if } S_T < K \end{cases}$$

$$= \max\left(K - S_T, 0\right)$$

$$\text{PnL of put} = \max\left(K - S_T, 0\right) - P$$

	MAX GAIN	MAX LOSS
LONG PUT	K - P	P (premium)
SHORT PUT	P (premium)	K - P

	LONG CALL	SHORT CALL	LONG PUT	SHORT PUT
BREAK-EVEN	K+C	K+C	K-P	K-P