

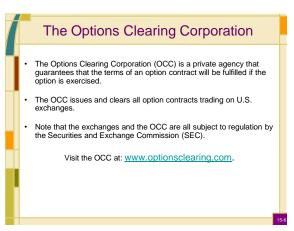




 A list of available option contracts and their prices for a particular security is known as an option chain.

- Stock option ticker symbols include:
 - Letters to identify the underlying stock.
 - A letter to identify the expiration month as well as whether the option is a call or a put. (A through L for calls; M through X for puts).
 - A letter to identify the strike price (a bit more complicated—see Yahoo or Stock-Trak for tables to explain this letter.)

	TABLE 15.1 Stock Option Ticker Symbol and Strike Price Codes								
		Expiration Month	Calls	Puts	Strike S	A	Strike 70	N	
		January February	B	M	10	8	75	0	
		March	c	o	15	c	80		
		April	D	P	20	D	85	0	
		May	E	0	25	E	90	R	
		June	F	R	30	F	95	5	
		July	G	5	35	G	100	T	
		August	н	т	40		7.5	U	
		September	1	U	45	1	12.5	٧	
		October	1	v	50	1	17.5	w	
		November	к	w	55	к	22.5	х	
		December	L	×	60	L	27.5	Y	
					65	м	32.5	z	



Stock Index Options

- · A stock index option is an option on a stock market index.
- The most popular stock index options are options on the S&P 100, S&P 500, and Dow Jones Industrial Average.
- Because the actual delivery of all stocks comprising a stock index is impractical, stock index options have a cash settlement procedure.
 - That is, if the option expires in the money, the option writer simply pays the option holder the intrinsic value of the option.
 - The cash settlement procedure is the same for calls and puts.

Option "Moneyness"

- "In-the-money" option: An option that would yield a positive payoff if exercised
- "Out-of-the-money" option: An option that would NOT yield a positive payoff if exercised
- · Use the relationship between S (the stock price) and K (the strike price):

	In-the-Money	Out-of-the-Money
Call Option	S > K	S≤K
Put Option	S < K	S≥K

Note for a given strike price, only the call or only the put can be "in-the-money."

Option Writing

- · The act of selling an option is referred to as option writing.
- · The seller of an option contract is called the writer.
 - The writer of a call option contract is obligated to sell the underlying asset to the call option holder.
 - The call option holder has the right to exercise the call option (i.e., buy the underlying asset at the strike price).
 - The writer of a put option contract is obligated to buy the underlying asset from the put option holder.
 - The put option holder has the right to exercise the put option (i.e., sell the underlying asset at the strike price).
- Because option writing obligates the option writer, the option writer receives the price of the option today from the option buyer.

Option Exercise

- Option holders have the right to exercise their option.
 If this right is only available at the option expiration date, the option is said to have European-style exercise.
 - If this right is available at any time up to and including the option expiration date, the option is said to have American-style exercise.
- Exercise style is not linked to where the option trades. Europeanstyle and American-style options trade in the U.S., as well as on other option exchanges throughout the world.
- Very Important: Option holders also have the right to sell their option at any time. That is, they do not have to exercise the option if they no longer want it.

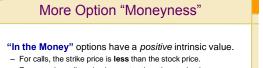
Option Payoffs versus Option Profits

- Option investment strategies involve initial and terminal cash flows.
 - Initial cash flow: option price (often called the option premium).Terminal cash flow: the value of an option at expiration (often
 - called the option payoff.
- The terminal cash flow can be realized by the option holder by exercising the option.

Option Profits = Terminal cash flow - Initial cash flow

Option Intrinsic Values

- The *intrinsic value* of an option is the payoff that an option holder receives if the underlying stock price does not change from its current value.
- That is, if S is the current stock price, and K is the strike price of the option:
- Call option intrinsic value = MAX [0, S-K]
 - In words: The call option intrinsic value is the maximum of zero or the stock price minus the strike price.
- Put option intrinsic value = MAX [0, K-S]
 - In words: The put option intrinsic value is the maximum of zero or the strike price minus the stock price.



- $-\,$ For puts, the strike price is $\ensuremath{\textit{greater}}$ than the stock price.
- "Out of the Money" options have a zero intrinsic value.
 - For calls, the strike price is greater than the stock price.
 - For puts, the strike price is less than the stock price.
- "At the Money" options is a term used for options when the stock price and the strike price are about the same.

Arbitrage and Option Pricing Bounds

Arbitrage:

- No possibility of a loss
- A potential for a gain
- No cash outlay
- In finance, arbitrage is not allowed to persist.
 "Absence of Arbitrage" = "No Free Lunch"
 - The "Absence of Arbitrage" rule is often used in finance to calculate option prices.
- Think about what would happen if arbitrage were allowed to persist. (Easy money for everybody)

The Upper Bound for a Call Option Price

- · Call option price must be less than the stock price.
- Otherwise, arbitrage will be possible.
- How?

 Suppose you see a \$65 call option selling for \$1, and the underlying stock is selling for \$60.

- The Arbitrage: option is exercised and you pocket \$4.

The Lower Bound on Option Prices

- Option prices must be at least zero.
- An option holder can simply discard the option.
 This means that no one would pay someone to take an option off their hands.
- Therefore, the price of the option cannot be negative.

Put-Call Parity

- Put-Call Parity is perhaps the most fundamental relationship in option pricing.
- Put-Call Parity is generally used for options with European-style exercise.
- Put-Call Parity states: the difference between the call price and the put price equals the difference between the stock price and the discounted strike price.

The Put-Call Parity Formula

$$C - P = S - K/(1+r)^{T}$$

In the formula:

- C is the call option price today
- S is the stock price today
- r is the risk-free interest rate
- P is the put option price today
- $-\,$ K is the strike price of the put and the call
- $-\$ T is the time remaining until option expiration

Note: this formula can be rearranged: $K/(1+r)^{T} = S + P - C$