Options Trading Strategies

How to Hedge Using Options

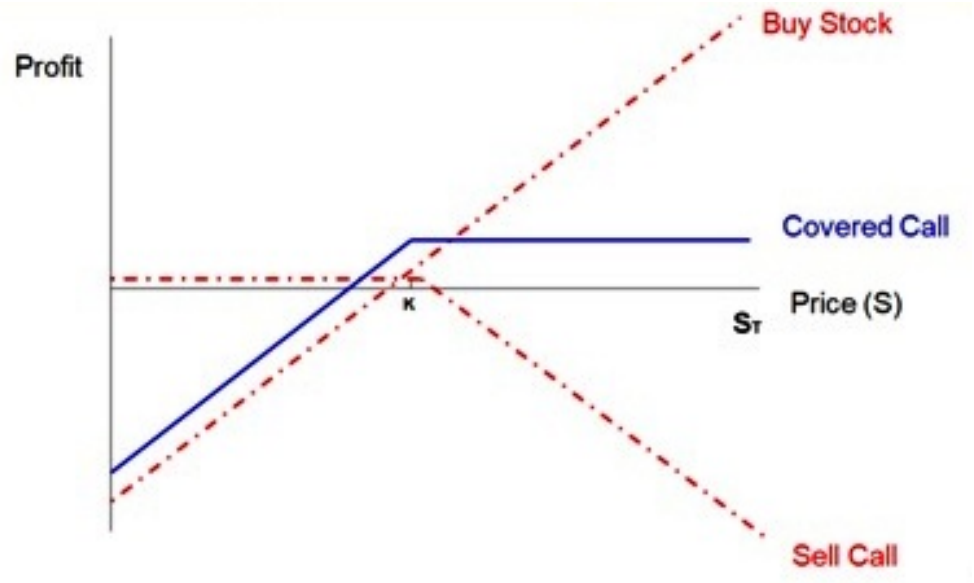
Using options for hedging is, relatively speaking, fairly straightforward; although it can also be part of some complex trading strategies. Many investors that don't usually trade options will use them to hedge against existing investment portfolios of other financial instruments such as stock. There a number of options trading strategies that can specifically be used for this purpose, such as covered calls and protective puts.

Covered call - Sell a call option and Buy Stock

Covered call is an option strategy in which the option writer writes a call option on an asset he already owns. It is called a covered call because the potential obligation under the call option is covered by ownership in the underlying stock.

Covered call is just opposite to naked call, which is a strategy in which the option writer writes a call option without having any covering position in the underlying asset.

Investors write covered calls when they expect the price of the underlying stock to rise but stay below the exercise price (also called strike price). They pocket the option premium by writing the call options and hope that they expire out of the money.



Example:

X wrote 100 call options on GS stock when the stock price was 155 per share. He received a premium of 10 per option for exercise price of 160. Discuss the profit from the position if price of GS stock at exercise date is (a) 220, (b) 180, (c) 160, (d) 130 and (e) 0

If price of GS stock is 220, the value of the call option will be 60 [=max of 0 and (220 minus 160)], so the option holder will exercise it. Nick will have to sell the stock to the option holder for 160. His total profit from the position will be 1,500 as calculated below:

Profit on covered call if price of underlying is 220
= 100 × (220 − 155 − max [0, 220 − 160] + 10)

If price of GS stock is 180, the value of the call option will be 20 and the option writer will generate a profit of 1,500:

Profit on covered call if price of underlying is 180
= 100 × (180 − 155 − max [0, 180 − 160] + 10)

If the stock price is 150, the profit to option writer will be 1,500

Profit on covered call if price of underlying is 160
= 100 × (160 − 155 − max [0, 160 − 160] + 10)

If the stock price is 130, the profit to option writer comes out to be -1,500

Profit on covered call if price of underlying is 130
= 100 × (130 − 155 − max [0, 130 − 160] + 10)

If the price is down to 0, his maximum loss will be -14,500

Profit on covered call if price of underlying is 0
= 100 × (0 − 155 − max [0, 0 - 160] + 10)

The profit calculated above can be plotted as shown below. This the profit diagram of a covered call.

Advantage:

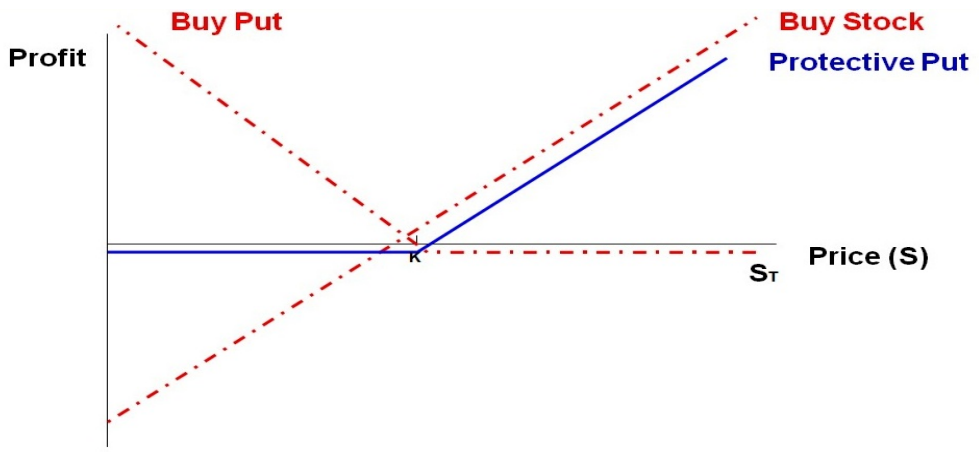
When there is a sharp rise in the stock price, purchased stock protects the seller of the call from pay-off

Appropriate: A sharp rise in stock prices is expected

Protective Put - Buy a Stock & Buy a Put

Protective put is an option strategy in which an investor purchases a put option to guard against any loss on the underlying asset which he already owns. Protective put is like insurance against loss on the underlying asset.

Investors buy protective put when they expect the underlying stock to increase in value but at the same time they want to remove any downside risk.



Example

Y 100 shares of Citigroup for 30 in October 2019. The stock is currently fetching 50 per share and he is quite happy with his pick. He thinks it is more likely that the stock will go up even further in next few months. But to guard against the possibility of any drop, he bought put options on Citigroup stock. He paid 5 per option and they carry an exercise price of 50 per option.

Discuss his profit from the position if Citigroup stock price at the exercise date is (a) 100, (b) 80, (c) 50, (d) 20, and (e) 0

If Citigroup stock price at the exercise date is 0, the value of his option will be 50 [= max[0, 50 − 0]]. His total profit from the whole strategy will be -500 as calculated using the formula below:

Profit on protective put if Citigroup stock price is 0 = 100 × (0 − 50 + max [0, 50 - 0] - 5)

Below is the calculation of profit from the strategy at the other prices:

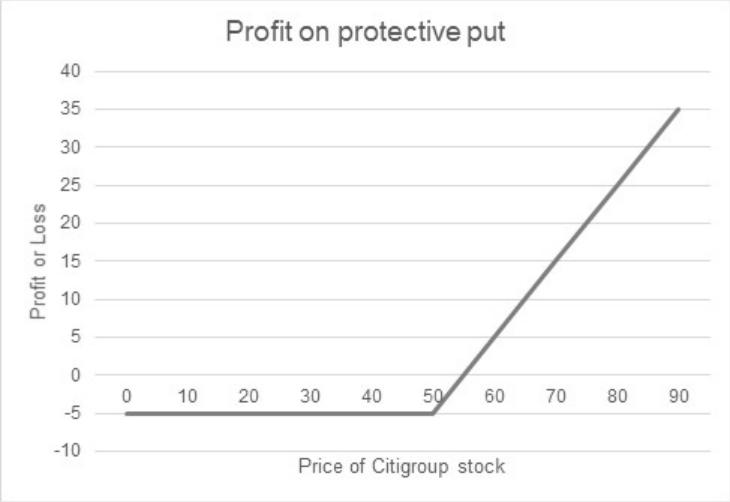
Profit on protective put if Citigroup stock price is 20
= 100 × (20 − 50 + max [0, 50 − 20] − 5) = -500

Profit on protective put if Citigroup stock price is 50
= 100 × (50 − 50 + max [0, 50 − 50] − 5) = -500 = -500

Profit on protective put if Citigroup stock price is 80
= 100 × (80 − 50 + max [0, 50 − 80] − 5) = -2,500

Profit on protective put if Citigroup stock price is 100
= 100 × (100 − 50 + max [0, 50 − 100] − 5) = -4,500

The illustration just validates the plot given below for profit on protective put.



Advantages:

1. This combination of stock and put establishes a floor. It allows unlimited profits while limiting the potential loss.

* This is like purchasing insurance for your stock

2. Potential gains or losses are created from the net effect of a long position in both the put and the stock. This establishes a floor, allowing unlimited profits while limiting the potential loss.

3. Should the stock price decline below the strike price before expiration of the option, the investor would exercise the put option & sell his or her stock at the strike price

4. Should the stock price increase above the strike price, the option would not be exercised & the investor could sell the stock at the higher price & recognize a profit if the stock price is above the overall cost of the position.

Combinations

There is variety of option combinations which a trader can adopt to suit his risk profile.

Straddle

Buy Call and Put at the same Strike Price and Expiration

Stock Price Range	**Payoff from Call**	**Payoff from Put**	**Total Payoff**	**Cost**	**Profit**
ST <= K	0	K - ST	K - ST	Ccall + Cput	Payoff - Cost

ST > K	ST - K	0	ST - K	Ccall + Cput	Payoff - Cost

ST <= K	stock price	50
ST > K	stock price	60
K	strike price	55
Ccall	price of call	3.5
Cput	price of put	2.75

Stock Price Range	**Payoff from Call**	**Payoff from Put**	**Total Payoff**	**Cost**	**Profit**
ST <= K	0	5	5	6.25	-1.25
ST > K	5	0	5	6.25	-1.25

Spreads

Options spread basically consists of taking a position on two or more different options contracts that are based on the same underlying security. For example, if you buy contracts on a particular stock and also write contracts on that same stock, then you have essentially created an options spread.

Bull Spread

Bull Spreads with Call: Buy Call option and Sell Call on a higher strike price

Buy a Call at Low Strike Price, Sell Call at High Strike Price, Same Expiration Date

Stock Price Range	**Payoff from Long Call Option**	**Payoff from Short Call Option**	**Total Payoff**
ST >= K2	ST - K1	K2 - ST	K2 - K1

K1 <ST < K2	ST - K1	0	ST - K1
ST <= K1	0	0	0

Advantage: Limits the investor's upside & downside risk

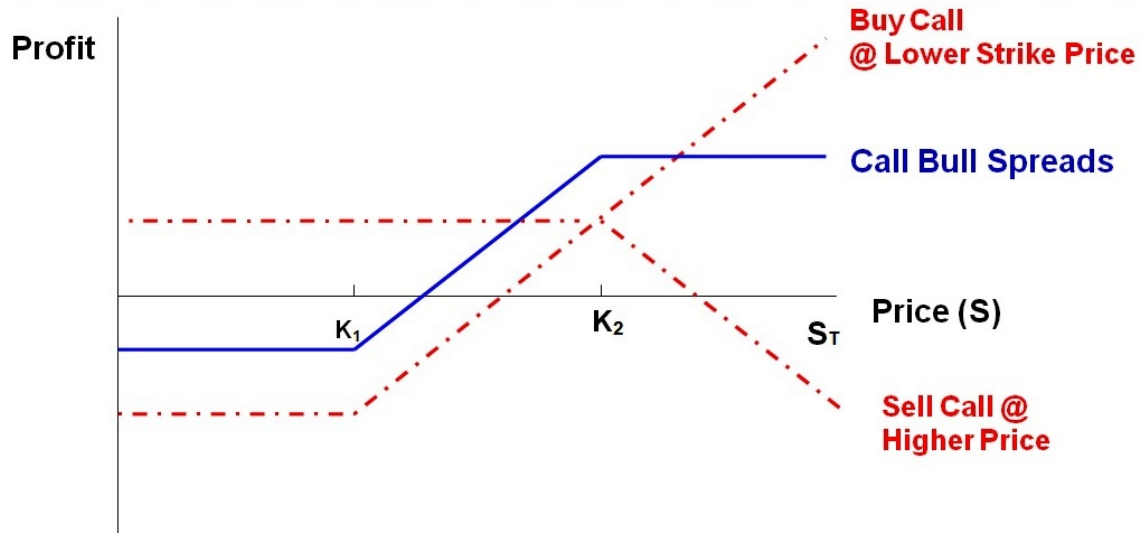
Appropriate: When the investor expects stock prices to go up

Example: January 2020 X Ltd

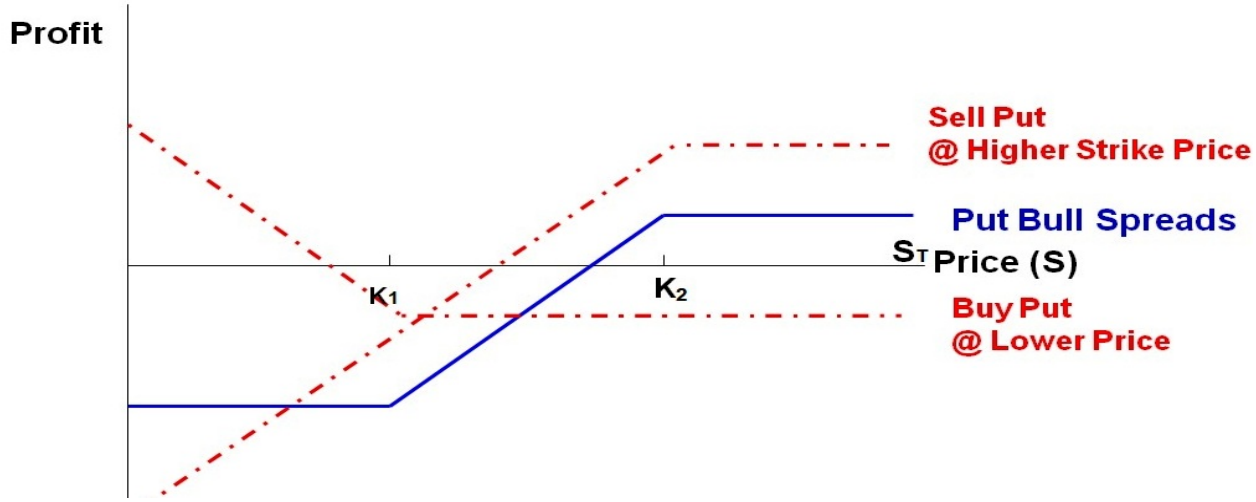
		X Ltd Jan 2020	Price of Option
$S_T >= K_2$	**Stock Price**	70	
$K_1 < S_T < K_2$	**Stock Price**	60	
$S_T <= K_1$	**Stock Price**	50	
K_1	**Call Option at Low Strike Price**	***55***	***5.25***
K_2	**Call Option at High Strike Price**	***65***	***1.5***

X Ltd January 2020

Stock Price Range	Payoff from Long Call Option	Payoff from Short Call Option	Total Pay off	Cost	Profit
ST >= K2	15	-5	10	-3.75	6.25
K1 <ST < K2	5	0	5	-3.75	61.25
ST <= K1	0	0	0	-3.75	-3.75



Bull Spreads with Put: Buy Put option and Sell Put on a higher strike price



Bear Spread

Bear Spreads with Call: Sell Call option and Buy Call on a higher strike price

Buy Call at High Strike Price, Sell Call at Low Strike Price, Same Exercise Date

Stock Price Range	Payoff from Long Call Option	Payoff from Short Call Option	Total Payoff
ST >= K2	ST - K2	K1 - ST	-(K2 - K1)
K1 <ST < K2	0	K1 - ST	-(ST - K1)
ST <= K1	0	0	0

Advantage: Limits the investor's upside & downside risk

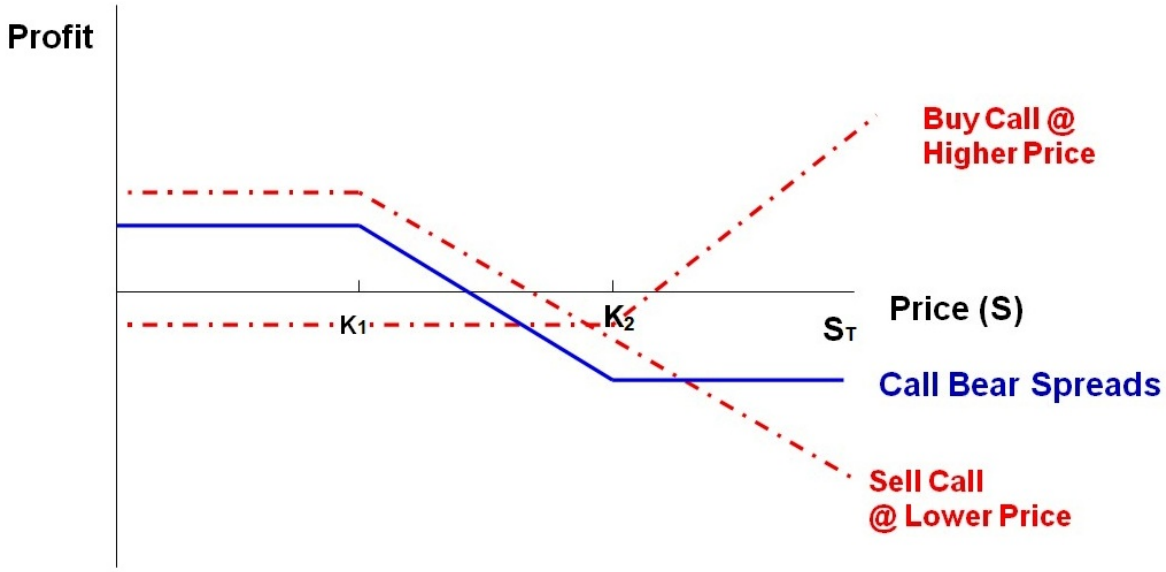
Appropriate: When the investor expects stock prices to go down

Example: January 2020 X Ltd

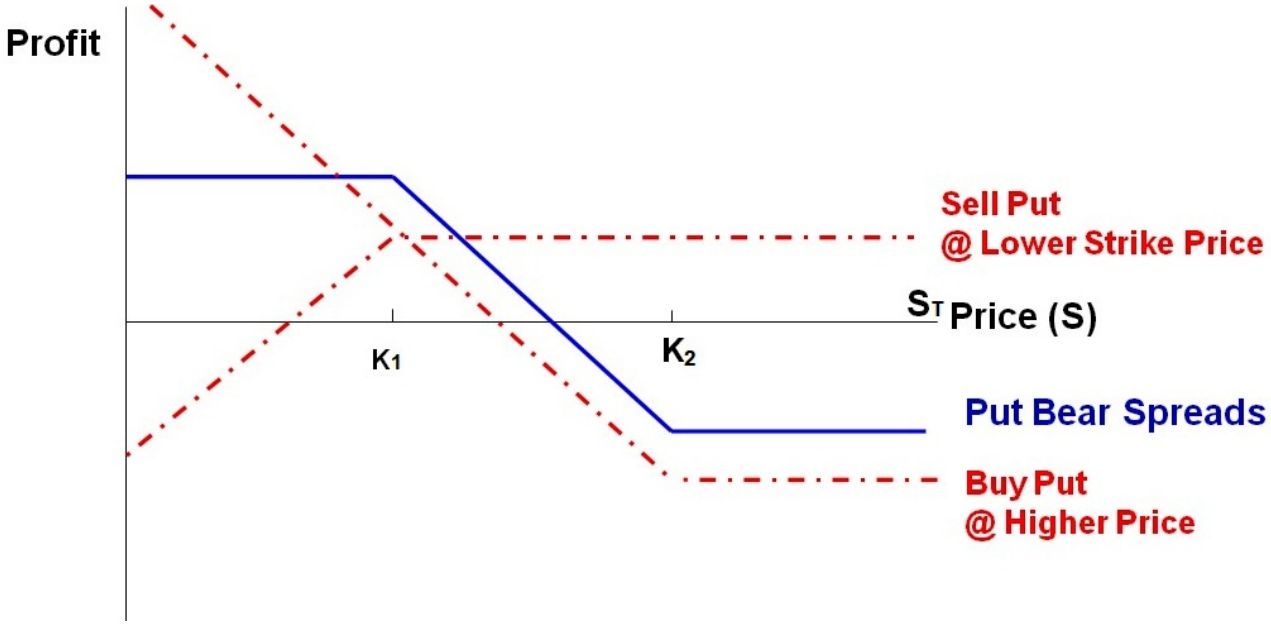
		X Ltd Jan 2020	Price of Option
ST >= K2	Stock Price	70	
1 T K2	Stock Price	60	
ST <= K1	Stock Price	50	
K1	Call Option at Low Strike Price	55	5.25
K2	Call Option at High Strike Price	65	1.5

X Ltd January 2020

Stock Price Range	Payoff from Long Call Option	Payoff from Short Call Option	Total Payoff	Cost	Profit
ST >= K2	15	-15	-10	3.75	-6.25
K1 <ST < K2	0	-5	-5	3.75	-1.25
ST <= K1	0	0	0	3.75	3.75



Bear Spreads with Put: Sell Put option and Buy Put on a higher strike price


Profit
Sell Put
@ Lower Strike Price
S_T Price (S)
K_1
K_2
Put Bear Spreads
Buy Put
@ Higher Price

Option Greeks and Risk Management

Option Greeks are the set of statistical values that are used to express the change in the option price. This is mostly referred to as sensitivity to parameters. The use of derivatives is mainly risk management.

Delta

Delta basically measures the option price change when the stock price changes increase by Re1. For example, if we have a delta value of 0.5, it means that when the price of the underlying moves by a point, the price of the corresponding call option will change by half a point. If delta = 0.5, a Re1 increase in the underlying's price triggers a Re0.5 increase in the price of the call option.

Gamma

It measures how fast the delta changes for small changes in the underlying stock price. i.e. the delta of the delta.

Theta

The change in option price given a one day decrease in time to expiration. Basically it is a measure of time decay.

Rho

The change in option price given a one percentage point change in the risk-free interest rate. It is sensitivity of option value to change in interest rate. Rho indicates the absolute change in option value for a one percent change in the interest rate. For example, a Rho of .050 indicates the option's theoretical value will increase by .050 if the interest rate is decreased by 1.0.

Vega

Sensitivity of option value to change in volatility. Vega indicates an absolute change in option value for a one percent change in volatility. For example, a Vega of .080 indicates an absolute change in the option's theoretical value will increase by .080 if the volatility percentage is