Derivatives Primer :

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Section 1

Derivatives:

A derivative is a financial instrument, which derives its value from some other asset. This “other asset” is called the underlying. A rice farmer may wish to contract to sell his harvest at a future date to eliminate the risk of a change in prices by that date. The price for such a contract would obviously depend upon the current spot price of rice. Such a transaction could take place on a rice forward market. Here, the rice forward is the “derivative” and rice on the spot market is “the underlying”.

The underlying could be equity shares or an index, a commodity, a currency, bonds, etc. Derivative products vary according to their structure and terms and conditions. The most popular derivative products are Forwards, Futures and Options.

Derivative Contract is a contract that specifies the rights and obligations between two parties to receive or deliver future cash flows (or exchange of other securities or assets) based on some future event.

FAQ on Futures

- ***What are futures?***

Futures are derivatives. These are securities whose value depends on the value of an underlying asset, which could be a commodity or a financial instrument. A future or a forward contract is an agreement between two parties to buy or sell an underlying asset at a certain time in the future for a certain price, which is fixed now. One party buys the asset and the other party sells the asset.

- ***What are some commonly used derivatives?***

Some commonly used derivatives are forward contracts, futures, options, swaps and warrants.

- ***What is the nature of the underlying asset?***

Underlying assets can be of several types, such as:

- Agricultural commodities such as wheat, corn, or rice.
- Animal products such as pork.
- Metals such as iron or gold.
- Shares, currencies and bonds.
- Share indices.

The first four asset types have a physical existence in some form. The last one is merely a number calculated on the basis of a basket of share prices and have no physical existence.

- ***Are futures and forward contracts the same?***

No. Forward contracts are contracts entered into privately between two parties as above. Futures contracts are contracts that are traded on an exchange.

- ***What are the differences between futures contracts and forward contracts?***

In quite a few ways, futures contracts are superior to forward contracts. Some of them are:

No counter-party risk: Since the exchange takes the responsibility of settling every trade, each party to the contract will have his portion settled, irrespective of whether the other party settles or not. But in forward contracts, the failure of one party to the contract can lead to non-settlement of the contract itself.

Liquidity: Since futures are traded on an exchange, they are very liquid. It is possible to get in and out of futures positions pretty fast. This feature does not exist in forward contracts since they are not traded on any exchange.

Uniformity: Futures contracts are standardised in terms of the size of the contract, the delivery date and the quality of the commodity itself. Such standardisation does not exist in the case of forward contracts.

Still, forward contracts are popular because they can be structured in a manner to suit both parties to the contract in terms of size of contract or maturity date or quality / nature of commodity or financial asset. In fact, the forward market for foreign currencies dominated by banks is the largest financial market in the world.

Another difference is that in the case of futures, the exchange collects initial margin and marks to market the contract on a daily basis. So each of the parties to a contract either receives or pays out the difference. But with forwards, there is no such mark to market arrangement and all differences are settled at the maturity of the contract.

E.g. Let us illustrate this with an example:

- Mr. Sharma buys a futures contract on the exchange which entitles him to receive 100 shares of ABC Industries three months hence paying a price of Rs 350 per share.
- Simultaneously, the counter-party to the contract, Mr. Tripathi has an obligation to deliver 100 shares of ABC three months hence and receive Rs 350 per share.
- Given the current market price of ABC is Rs. 350, we could have three situations tomorrow:
- The price moves up to Rs 360: Then Mr. Sharma will receive Rs 1,000 (100 shares multiplied by difference of Rs 10 per share) from the exchange and Mr. Tripathi will have to pay Rs 1,000 to the exchange.
- The price falls to Rs 340 : Then Mr. Sharma will have to pay Rs 1,000 (100 shares multiplied by difference of Rs. 10 per share) to the exchange and Mr. Tripathi will receive Rs 1,000 from the exchange.
- The price remains unchanged at Rs 350 : Then neither Mr. Sharma nor Mr. Tripathi will have to pay or receive anything.

Such marking of the contract to changes in market price does not happen with forward contracts.

- ***What are financial futures?***

Financial futures are futures where the underlying asset is a financial instrument such as a share, currency or an index.

- ***Is there a difference between financial futures and commodity futures, other than the nature of the underlying asset?***

Commodity futures are settled by cash or by delivery of the concerned commodity based on the specifications of the contract. Financial futures are mostly settled in cash, by paying out or receiving differences and rarely by delivery.

- ***What is meant by standardisation of futures?***

  The exchange standardises futures contracts in terms of the following features:

  - Value or size : All futures contracts based on a particular underlying instrument, say the S&P CNX Nifty, would be of the same size.
  - Contracts available for trade: Usually monthly contracts are available for trade.
  - Range of fluctuation: It is the tick or amount by which price of futures contract can move up or down. For example, in a stock or Index futures contract, the tick could be Rs 0.05 or 5 paise.

  In the case of commodity futures, the exchange also specifies the product quality and the delivery location.

- ***What do 'going long' or 'going short' in a futures contract mean?***

  The buyer of a future contract is said to 'go long' the future, whereas the seller is said to 'go short' that future.

- ***What do price changes of a futures contract reflect?***

The price changes of the future will reflect the price changes of the underlying instrument (share or index). With a long position, the value of the position rises as the price of the underlying instrument rises and it falls as this price falls. With a short position, a loss ensues if the price of the underlying instrument rises, while profits are generated if this price falls.

- ***How is the performance of the parties to a futures contract guaranteed?***

Clearing houses at futures exchanges guarantee the performance of the parties to a futures contract. This is accomplished by a process called novation, wherein the clearing house functions as a seller to every buyer and a buyer to every seller. As a result, after a trade is concluded, the two parties to the trade need not interact with each other at all. The clearing house settles each leg of the trade independently. In the case of commodity futures, clearing houses also facilitate settlement by delivery.

- ***How do clearing houses guarantee trades?***

Each clearing house will have a mix of strategies to ensure that, even in the most volatile of markets, each party to a contract fulfils its obligation. These are accomplished by a strict system of initial and mark to market margins imposed on the members of the clearing house, who settle the trades with the clearing house.
In addition to this, most clearing houses also get themselves insured against failure of their members and build up contingency funds from contributions by their members to safeguard against large scale failures.

- ***Is futures trading meant for someone like me?***

Futures trading is very useful to three categories of people. If your investing style matches any of the three following categories, you would find futures trading useful:

- **Speculators :**

  A speculator is a person who takes a view on the value of the futures contract and takes a position in the instrument. For example, a speculator might think that ABC prices would go up from their existing level. Hence he will go long (or buy) ABC futures. Or a speculator might think that XYZ shares would go down from their current price levels. Hence he will go short (or sell) XYZ futures. A speculator would use futures instead of taking a position in the underlying asset because futures give cash flow efficiency. Instead of paying the value of the underlying asset up front, only the initial margin is paid, with daily profits and losses being settled on a day to day basis. Thus futures are highly geared alternative to cash market positions.

You could speculate, too. But remember; speculate only to the extent that you can afford to lose. Never over extend yourself.

o **Arbitrageurs:**

An arbitrageur is a person who takes advantage of price differentials between two markets and makes profit in the process. For example say ABC shares are available on the BSE for Rs 300 and a one-month futures is quoting at Rs 320. The arbitrageur will buy ABC shares on the BSE and sell the one-month futures contract. On maturity of the futures contract, he will deliver the ABC shares and receive Rs 320, thus booking a profit of Rs 20 per share. An arbitrageur takes a covered position, in that he is not exposed to price risks in either market. You too could arbitrage between the two markets. However, such opportunities are available for very short periods of time and should be taken advantage of quickly.

o **Hedgers:**

A hedger is a person who has a position in an underlying asset and takes an opposite position in the futures market to protect his price. Say you have a portfolio of shares. Current market valuations are pretty good, but you do not want to sell say because of tax reasons. You are, however, afraid that the market may crash and your portfolio value would come down. You can do hedging of the portfolio by selling index futures of equivalent value. If the market falls down, the profit on the index futures contract will offset the loss on your portfolio. If the market goes up, the loss on the futures contract will be offset by the profit on your portfolio.

- ***What is a spot price in a futures market?***

The spot price is the price of the underlying asset in the spot or cash market.

- ***What is the expiry date of a futures contract?***

The expiry date of a futures contract is the date on which the buyer and seller have to settle their obligations to the exchange.

- ***What is an index future?***

Futures contracts whose value depends on the value of an underlying share index are known as index futures. Each share trades at a specific price at any point of time. But there is a need to represent the price of the market as a whole. This is done by identifying a basket of shares that is representative of this market, and tracking their consolidated value in terms of their base value. The value of this basket of shares is the value of the share index comprising these shares.

- ***How do investors benefit from index futures?***

As investors are always affected by fluctuations in the market index, hedging using index futures is more effective for an investor rather than hedging with a (single) share future.

- ***Where can I trade in futures in India?***

You can trade index and stock futures in Indian markets. Both the Bombay Stock Exchange and the National Stock Exchange offer trading in futures linked to the value of their underlying. Besides, the BSE Sensex and the S&P CNX Nifty, you can also trade in NSE Bankex , NSE IT, Minifty, CNX100, Nifty Junior and Midcap50 indices.

- ***What are the Risks in Futures trading ?***

All investments in market carry two types of risk – Instrument specific risks and Market specific risks. This principle is true of any type of commodity, debt or equity exposure. Albeit the intensity of underlying risks varies in each investment significantly.

Market-specific risks are all events that may affect the entire market, such as political uncertainty, direction of economy, war-like conditions, drought etc. In the case of Stock markets, when such events occur all securities are summarily marked down irrespective of individual merit. For example, when aggression on Kargil front was announced in 1999, participants marked down the value of all stocks summarily in the initial stages of panic that gripped the nation.

- ***What is a daily price movement limit?***

Daily price movement limits are the limits on the extent to which futures prices are allowed to vary from day to day. These limits are prescribed by the exchanges to prevent large price movements due to excessive speculation.

- ***What derivative contracts are permitted by SEBI?***

Derivative products have been introduced in a phased manner starting with Index Futures Contracts in June 2000. Index Options and Stock Options were introduced in June 2001 and July 2001 followed by Stock Futures in November 2001. Sectoral indices were permitted for derivatives trading in December 2002.

- ***How many instruments/underlying are available for futures trade in India.***

Currently (as on Sept 2008) the NSE permits Futures trading on 7 Index Futures (including Sectoral indices) and 266 stocks.

- ***What is the eligibility criteria for stocks on which derivatives trading may be permitted?***

A stock on which stock option and single stock future contracts are proposed to be introduced is required to fulfill the following broad eligibility criteria:-

The stock shall be chosen from amongst the top 500 stock in terms of average daily market capitalisation and average daily traded value in the previous six month on a rolling basis.

The stock's median quarter-sigma order size over the last six months shall be not less than Rs.1 lakh. A stock's quarter-sigma order size is the mean order size (in value terms) required to cause a change in the stock price equal to one-quarter of a standard deviation.

The market wide position limit in the stock shall not be less than Rs.50 crores.

A stock can be included for derivatives trading as soon as it becomes eligible. However, if the stock does not fulfill the eligibility criteria for 3 consecutive months after being admitted to derivatives trading, then derivative contracts on such a stock would be discontinued.

- ***What is minimum contract size?***

The Standing Committee on Finance, a Parliamentary Committee, at the time of recommending amendment to Securities Contract (Regulation) Act, 1956 had recommended that the minimum contract size of derivative contracts traded in the Indian Markets should be pegged not below Rs. 2 Lakhs. Based on this recommendation SEBI has specified that the value of a derivative contract should not be less than Rs. 2 Lakh at the time of introducing the contract in the market. In February 2004, the Exchanges were advised to re-align the contracts sizes of existing derivative contracts to Rs. 2 Lakhs. Subsequently, the Exchanges were authorized to align the contracts sizes as and when required in line with the methodology prescribed by SEBI.

- ***What is the lot size of a contract?***

Lot size refers to number of underlying securities in one contract. The lot size is determined keeping in mind the minimum contract size requirement at the time of introduction of derivative contracts on a particular underlying.

E.g. If shares of XYZ Ltd are quoted at Rs.1,000 each and the minimum contract size is Rs.2 lacs, then the lot size for that particular scrips stands to be 200000/1000 = 200 shares i.e. one contract in XYZ Ltd. covers 200 shares.

- ***What is a calendar spread?***

A calendar spread is a position where one contract cycle of a future is hedged by an offsetting future position of different contract cycle in the same underlying asset. For example, a short position in January month index futures contracts may be hedged by a long position in February month index futures contracts.

- **Margins:**

Two type of margins have been specified -

1. **Initial margins**
2. **Mark-to-market profit/loss**

- **Initial Margin**

  The computation of initial margin is based on 99% VaR (Value at Risk) and depends on the time in which Mark to Market margin is collected. Value at Risk stands for how much money in portfolio may stand to lose in certain time horizon. Initial margin amount computed using VaR is collected up-front.

- **Mark to Market Margin (MTM)**

  Collected in cash for all Futures contracts and adjusted against the available Liquid Net worth for option positions. In the case of Futures Contracts MTM may be considered as Mark to Market Settlement.

The actual margining happens on a daily basis while on line position monitoring is done on an intra-day basis.

A client purchases **50 units of FUTIDX NIFTY 29AUG2008 at Rs 4400.**
The initial margin payable as calculated by VaR is 15%.

Total long position	Rs. 2,20,000 (50*4400)
Initial margin (15%)	Rs 33,000

Assuming that the contract will close on Day + 3 the mark-to-market position will look as follows:

Position					
Buying Price		4,400			
Margin Required		4400 X 50 X 15%			
Margin Required		33,000	32,625	33,750	
Lot Size		50	50	50	
		Position on Day 1	**Position on Day 2**	**Position on Day 3**	
End of the Nifty Value		4,300	4,350	4,500	
		4300 X 50	4350 X 50	4500 X 50	
Total Value of Nifty		215,000	217,500	225,000	
Margin Block at End of the day		32,250	32,625	33,750	
Original margin Blocked		33,000	32,250	32,625	
Margin Released/(Blocked) at end of the day		750	(375)	(1125)	
Profit / (Loss)		- 5,000	2,500	7,500	5,000
Total Amt Block at End of the day		Profit + Margin Blocked			
		37,250	30,125	26,250	
Margin Block		32,250	32,625	33,750	
Profit/(Loss) (Recovered/Release)		- 5,000	2,500	7,500	5,000

Marking to market means that each owner of a contract has to make good the loss on his position to the clearing house. Or he or she is paid the profit by the clearinghouse on a daily basis based upon the difference between the contract value of index-future and the index value at the end of respective trading day.

As per exchange rules The settlement of accounts for mark to market daily settlement and final settlement on participants' (buyer/seller) accounts are carried out as under:

Daily mark to market settlement where 'T' is the trading day.

Mark to market debit:	T+1
Mark to market credit:	T+1 .
Final settlement where	'T' is the expiration day.

The market participant hence does not need to worry about the financial health of counter party. This system lends safety and stability to the market besides decreasing the risk premium attached on the instrument.

Section 2

Financial Market Terms Explained

- **Stock Market Index:**

A Stock Market Index is a basket of representative scrips, which accurately reflects the trends of the market movement faithfully, and is an approximation of returns obtained in owning "the overall economy".

The BSE 30 Sensex, first compiled in 1986 is a market capitalisation weighted index based on free-float concept that represents thirty large well-established and financially sound companies .The Sensex also has the largest social recall attached with it – it was the first index to be launched by any Stock Exchange in India.

The Nifty S&P CNX Nifty is a more recent index based on market capitalisation of fifty large companies listed on the National Stock Exchange.

- **Derivatives**

A derivative is a product whose value is derived from the value of underlying asset, index, or reference rate. The underlying asset may be equity, forex, commodity, or any other asset.

- **Basis**

The difference between the spot price and the futures price is called the basis. In a normal market, the basis is negative. The basis reduces as the date of expiration of the contract comes closer, since there is a convergence of the futures price towards the spot price. On the date of expiration, the basis equals zero.

- **Daily settlement price**

Daily Settlement price is the closing price of the futures contracts for the trading day. The closing price is calculated as the last half an hour weighted average price or such other price as may be decided by the relevant authority from time to time.

- **Final Settlement Price**

Final settlement price is the closing price of the underlying securities on the last trading day of the futures contracts or such other price, as may be decided by the relevant authority from time to time.

Section 3

- ## Trading In Index Futures:

Futures are derivative instruments basically designed to nullify the market-risk of a particular investment product, or commodity. Index Futures are contracts whose underlying is the value of the index at any point of time. By the term underlying we mean that the value of future will be based on the valuation of the "underlying", which may be a commodity, or financial instrument. In Index Futures, the underlying could be the spot Nifty or spot Sensex or even sectoral indices for that matter. In Commodity Futures, say pepper, the spot price of pepper will be the "underlying" for futures on pepper. In India, Derivative Products for trading in index Futures were launched in June 2000.

In developed markets, futures on stock indices, debt, and security have large volumes although commodity futures are also hugely popular. In India futures markets exist on several agri commodities like castor seed, hessian, gur, potatoes, turmeric, pepper etc and also on metal, resource and precious metals through NCDEX, MCX. Recently Currency Futures have been introduced in the Indian market with NSE being first to offer this product.

Futures have very practical use for industries and various businesses, which need predictability of input costs. For example, corporations dealing in food products may make active use of commodity futures to hedge input costs of raw food products, prices of which may vary widely due to the seasonal nature of business.

To understand Futures, one will have to understand concepts of Risk, Future trading, derivatives, and other relevant terms used by the financial markets.

- ## Mechanics of Trading In Index Futures

A futures contract is a legally binding agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. The clearinghouse guarantees conclusion of each trade in futures in the same manner that it guarantees trade in equity transactions. In India, the clearinghouse would be the clearinghouse of the Stock Exchange (Bank of India), Mumbai, or the National Securities Clearing Corporation Ltd on the NSE. The clearinghouse on the strength of the Trade Guarantee Fund and Mark-to-market margin system guarantees sanctity of each and every trade.

Following are the basic features of index contracts:

- The S&P CNX Nifty Futures Contract has the 50 share S&P CNX Nifty Index as the underlying reference and trades on the National Stock Exchange. The Sensex Futures Contract has the 30 share BSE Sensex as the underlying reference and trades on the Bombay Stock Exchange. The NSE launched Mini derivative futures & options (MINIFTY) contracts from January 1, 2008. The new contract is a small derivatives contract and has a lot size of 20 for futures and options. The main contract NIFTY has lot size of 50. With the value of underlying at about 4,500 points the total contract size of MINIFTY can be estimated at about Rs.90,000. With the introduction of MINIFTY there are arbitrage possibilities between Nifty and mini Nifty derivative contracts.

- The maximum tenure of any index futures contract is three months. One can also enter into Futures contracts for tenures of one month and two months.

- The minimum value of a futures contract is about Rs 200,000

- **Initial margin:**

The computation of initial margin is done using the concept of "Value-at-Risk"(VAR) model, the initial margin is hence large enough to cover a one-day loss that can be encountered on 99% of days. VAR methodology seeks to measure the amount of value that a portfolio may stand to lose within one day. Initial margin is collected before the members are allowed to take any position.

- **Marking to market:**

Marking to market means that each owner of a contract has to make good the loss on his position to the clearinghouse. He or she is paid the profit by the clearing house on a daily basis based upon the difference between the contract-value or value as on previous day, of index-future and the index futures value at the end of respective trading day.

As per exchange rules, the settlement of accounts for mark to market daily settlement and final settlement on participants (buyer/seller) accounts are carried out as under:

Daily mark to market settlement

Where 'T' is the trading day
Mark to market debit: T+1
Mark to market credit: T+1
Where "T" is the Final settlement day
Final settlement debit: T+1
Final settlement credit: T+1

The market participant hence does not need to worry about the financial health of the counter party. This system lends safety and stability to the market besides decreasing the risk premium attached on the instrument.

- Liquidity and settlement of futures contracts:

To create liquidity and safety in markets the Exchange ensures that all future contracts are standardised, with a standard quantity and quality of the underlying instrument that can be delivered (or which can be used for reference purposes in settlement).

The contract expires at the end of the term and the exchange settles it on spot price basis on the last day of settlement. However, index futures contract may be offset prior to maturity by entering into an equal and opposite transaction. The trade in index futures is settled in cash at the time of delivery.

- **Pricing of Futures Contracts**

A contract in commodity future such as crude oil for example would factor in not only costs of financing the purchase, it would also have the insurance and storage costs added to its carrying costs.

The pricing of index futures is based on the cost-of-carry model, where carrying cost is the cost of financing the purchase of the portfolio underlying the index, minus the present value of dividends obtained from the stocks in the index portfolio.

The mathematical formula to calculate the price of Index future is given as :

F = S + C

Where,
F = Price of future
S = Spot price of future
C = Holding costs = financing cost less annualised dividend yield on Index
The current annual dividend yield on NSE S&P CNX Nifty is around 1.3 per cent.

The cost of carry model explicitly defines the relationship between the futures price and the related spot price. The difference between the spot price and the futures price is called the basis. In a normal market, the basis is negative.

- **Trading, Clearing, and Settlement**

The NSE has introduced trading in one-month, two-month, and three-month expiry cycles. All Futures contracts expire on the last Thursday of every month. Thus a January contract would expire on the last Thursday in January and a February contract would expire on the last Thursday of February. On the Friday following the last Thursday, a new contract having a three-month expiry would be introduced for trading. Thus at any point in time, three contracts would be available for trading with the first contract expiring on the last Thursday of that month. Depending on the time period for which you want to take an exposure in index futures, you can place buy and sell orders in respective contracts.

S&P CNX Nifty options contracts have 3 consecutive monthly contracts, additionally 3 quarterly months of the cycle March / June / September / December and 5 following semi-annual months of the cycle June / December would be available, so that at any point in time there would be options contracts with atleast 3 year tenure available. On expiry of the near month contract, new contracts (monthly/quarterly/ half yearly contracts as applicable) are introduced at new strike prices for both call and put options, on the trading day following the expiry of the near month contract.

Assuming that you enter futures trading in October 2007, then the October contract (the near one month contract) will expire on the 25th of Oct.2007 being the last Thursday of the month. The near two-month contract will expire on the 29th of Nov. being the last Thursday of November 2007 and the far three-month contract will expire on the 27th of Dec. being the last Thursday for the month of December 2007.

E.g.

Suppose you want to trade a lot of 50 units on the Nifty futures when index level is 4,500 then the approximate value of a single futures contract would be Rs 4,500 X 50 units = Rs 225,000

The minimum tick size of an index future is 0.05 point movement in the Nifty

Thus one tick movement would translate in value terms to 0.05 tick X 50 units position = Rs 0.05 X 50 = Rs 2.5 on an open position of 50 units.

- **The Concept of "Open Interest"**

An Open interest position in the futures market means the number of unclosed contracts at the end of a particular day. Investors tend to misinterpret the concept. There is considerable debate over the importance of volumes of trading in the futures market. Higher growth in volumes could result from `circular trading' where participants add up the volumes by buying and selling at the same time. This pushes up the volume without the transaction being a real one.

The concept of `open interest' becomes more important in this context. But, what then is an open interest position? By definition, the total number of options or futures contracts that are not closed or delivered at the end of a particular day is open interest. Open interest change reported on a day represents the increase or decrease in the number of contracts for that particular day. It is shown as a positive or negative number. A common misconception among investors is that open interest is the volume of futures trades.

E.g.

The following example will make this concept clearer. Let us assume that on day 1, A buys 1 futures and B sells the same. In such a case open interest, at the end of the day would be 1. Suppose on day 2, C buys 10 futures from D, then the open interest rises to 11. If A sells his 1 futures to D on day 3, then the total open interest would come down to 10. On day 4, if E comes in and buys 10 futures from C then, open interest would remain at 10 as E is only replacing C. Carrying this concept further, the ratio of open interest to volume traded could also give an idea of the true level of activity on the exchange as it juxtaposes the actual interest with the volumes being traded. It is also important to note that open interest must be understood from only one side and must not be double counted (as there are two parties involved in such a transaction).

Open interest is also used to indicate the trend and trend reversals for futures contracts. An increase in open interest along with an increase in price is said to indicate an upward trend. This means that more participants are entering

the market; involving additional buying and purchases are generally aggressive in nature. Similarly, an increase in open interest along with a decrease in price indicates a downward trend. An increase or decrease in prices while open interest remaining flat or declining may indicate a possible trend reversal. If the open interest numbers flatten following a rising trend in both price and open interest, this can be interpreted as a warning sign for an impending top.

High open interest at market tops is a bearish signal if the price drop is sudden, since this will force many `weak' longs to liquidate. Occasionally, such conditions set off a self-feeding, downward spiral. An unusually high or record open interest in a bull market is a danger signal. When a rising trend of open interest begins to reverse, we can expect a bearish trend. Therefore, the concept of open interest is of critical importance in the context of futures markets as they are indicative of the state of things to come, besides reflecting the genuine volumes on the exchanges.

- **Beta value of a stock**

The beta of a stock is the average impact of a 1 per cent move in the index that is reflected upon the individual stock. The National Stock Exchange tracks and updates beta of stocks and this data is readily available on its http//www.nseindia.com. Betas of stocks are calculated by using advanced financial formulae, which in essence follow the afore-mentioned principle. In absence of a beta value of a stock it is generally safe to assume the beta of a stock equivalent to 1, which denotes the same volatility as that of the entire market.

- **Using Beta Value in futures:**

Use beta value to determine the value of hedge you would use to de-risk the equity-portfolio from the risk of market volatility.

Suppose that you hold Tata Power worth Rs 1 million, and you would like to ensure that your investment in Tata Power is not eroded due to some adverse movement in the equity markets. To ensure safety of your investment you would have to sell "the market embedded within Tata Power-exposure" that is calculated by multiplying the exposure value with the beta value of Tata Power.

The beta value of Tata Power, is say 1.29
The value of Tata Power-exposure is Rs 1,000,000
1.29 X 1,000,000 = 1,290,000
Sell number of Nifty Futures equivalent in value to Rs 1,290,000

Your sell position (short position) on Nifty will approximately compensate the erosion in value of your position on Tata Power by yielding you profit on the short position opened on Nifty.

It should be noted that hedging does not remove losses completely, it is merely a mechanism for removal unwanted exposure to market risk. The hedged position makes less profit than the unhedged position. This risk reduction strategy works for any stock/portfolio, the risk reduction albeit varies from one stock to another stock. The risk reduction obtained through use of index hedge is in the range of 25 per cent to 60 per cent. The hedged position will generally make less profit than the unhedged position, yet the safety-net provided by hedged position is very useful to portfolio managers managing large investments. In case of portfolio composed of numerous stocks, the portfolio is hedged by calculating the weighted average beta of all stocks constituting the portfolio

Section 4

- **Derivative Strategies using Index Futures**

As explained earlier any position on a stock involves the inherent position on the market, so when you have bought Tata Power betting on its superior price performance you also bet on the upward movement of the index. The degree of index that you have bought into Tata Power (or any other stock for that matter) is measured in terms of "beta" of the stock.

Following are the basic modes of trading on the index futures market Hedging Strategies

1. Long stock, short index futures
2. Short stock, long index futures
3. Have portfolio, short index futures
4. Have funds, long index futures

- **Speculative Strategies**

1. Bullish view on index, long index futures
2. Bearish view on index, short index futures

- **Arbitrage Strategies**

1. Have funds, lend them to the market
2. Have securities, lend them to the market

- **Participants in the Futures markets**

There are three classes of Participants who use derivative markets:

1. **Hedgers** - Participants who want to transfer a risk component of their portfolio

2. **Speculators** - Participants who intentionally trade in index futures in pursuit of profit

3. **Arbitrageurs** - Participants who operate in different markets simultaneously, in pursuit of profit and efficient pricing.

- **Hedgers use Index Futures to mitigate the risk of market downturn**

Suppose a Fund manager of an FII perceives that his carefully selected portfolio of stocks will be depreciated due to an upcoming political crisis. In absence of Index futures he would have only two solutions to counter the problem Sell the entire holding and sit on cash, waiting for the crisis to have its play, and reconstruct the original portfolio at lower levels or; Hold on to the original portfolio throughout the ensuing crisis, watch its value shrink, and hope for better days to recoup the lost values.

However, armed with Index futures, he sells the entire value of the market risk on his portfolio by selling Index Futures of an equivalent amount i.e. going short on Index. Suppose the Index is 5,000 points when he executes his sell. During the crisis, the Index loses 800 points to rule at 4,200, the Fund manager feels that the crisis is over, and should recover. The Fund manager hence covers his short position by reversing the original transaction, i.e. buying back equal number of Index futures at 4,200 which he had sold at 5,000.The gains made on 800 point difference would cover the erosion in the value of his portfolio of stocks. Thus effectively he has a hedge on the value of his portfolio.

Suppose that his original assumption is wrong and market moves up instead of capsizing, in such a scenario the losses made on index futures would be roughly neutralised by the gains made on the portfolio.

- **Delayed funds, don't miss that rally**

At times you may want to enter markets expecting a bullish phase but the funds flowing to you may take time in coming into your hands.

You can take exposure to the equity markets by buying long futures equivalent to the amount you want invested in the market ultimately. You would have to pay initial margin of approximately 12-15 percent of the entire investment corpus to take an exposure of say Rs 5 million. You had say Rs 600,000 upfront, which you invested, as margin for buying futures worth Rs 5 million.

E.g.

You made a list of 14 stocks to buy, at 17th Feb prices, totaling approximately Rs. 5 million and decided to take delivery of stocks as and when your funds came in. Say the S&P CNX Nifty was at 4500. You entered into a LONG S&P CNX NIFTY MARCH FUTURES position for 1100 Nifty, i.e. your long position was worth 4,950,000.

From 18th Feb to 9th Mar you gradually acquired the individual stocks each day and sold off a corresponding amount of futures.

On each day, the stocks purchased were at a changed price (as compared with the price prevalent on 17th Feb). On each day, you obtained or paid the 'mark-to-market margin on your outstanding futures position, thus capturing the gains on the index.

By 9th Mar you had fully invested in all the shares that you wanted (as of 17th Feb) and had no futures position left. The same sequencing of purchases, without the umbrella of protection of the LONG S&P CNX NIFTY MARCH FUTURES position, would have cost more as you would have to wait for all the funds to arrive in your hands a month later as by that time stocks you had listed would have appreciated. You were able to gain the appreciation by way of long position on the index, which was used to partially neutralise the rise in cost of your purchases.

- **Bearish on Index, but shares not at hand**

Reverse strategy may be employed in case you feel that market is going to fall, however, your shares are not available immediately. In such a scenario you could just short the futures equivalent to the amount of your entire portfolio and then cover your short position on futures when you actually sell shares as and when they are available. The depreciation in the sale price of your shares will be covered to an extent by the profit you make on short-selling the index.

- **Speculative Strategies**

Speculators in stock markets take advantage of the high leverage offered (approximately 4 times to 6 times the funds available) by margin system in the index futures to punt on index movements and profit from the index movement. You can either buy selected liquid securities, which move with the index, and sell them at a later date, or buy the entire index portfolio and then sell it at a later date.

The first alternative is widely used – a lot of the trading volume on stocks like RELIANCE is based on using RELIANCE as an index proxy. However, these positions run the risk of making losses owing to RELIANCE specific news; they are not purely focused upon the index.

The second alternative is hard to implement. An investor needs to buy all the stocks in S&P CNX Nifty in their correct proportions. Most retail investors do not have such large portfolios. This strategy is also cumbersome and expensive in terms of transaction costs.

Using index futures, an investor can "buy" or "sell" the entire index by trading on one single security. Once a person buys S&P CNX NIFTY using the futures market, he gains if the index rises and loses if the index falls.

E.g.

5th Jan. - You feel the market will rise

Buy 100 S&P CNX NIFTY January futures contract at 4,500 costing Rs.450000 (100*4500)

14th Jan. Nifty January futures have risen to 4,570

You sell off your position at 4,570

Make a profit of Rs. 7,000 (100* 70). Your investment is the initial margin due.

Similarly, after a bad budget, bad corporate results, or the onset of a coalition government, many people feel that the index would go down.

Once a person sells S&P CNX NIFTY using the futures market, he gains if the index falls and loses if the index rises.

E.g.

8th Feb - You feel the market will fall

Sell 100 S&P CNX NIFTY February expiry contract

February contract is trading at 4,570. Your position is worth Rs. 457,000

25th Feb Nifty - Nifty February futures have fallen to 4,520

You square off your position at 4,520

Make a profit of Rs.5,000 (100*50). Your investment is the initial margin due.

- **Arbitrageurs lend securities to market to earn return on long-term holdings**

The index futures market offers a risk less mechanism for (effectively) loaning out shares and earning a positive return for them. There is no price risk (since you are perfectly hedged) and there is no credit risk (since your counter party on both legs of the transaction is the National Securities Clearing Corporation).

You would sell all 50 stocks in S&P CNX Nifty and buy them back at a future date using the index futures (buy on day 1 and sell on last day). You would soon receive money for the shares you have sold. You can deploy this money, as you like until futures expiration. On the expiration date, you would buy back your shares, and pay for them.

Section 5

Trading in Options

Options are contracts, which gives the buyer (holder) the right, but not the obligation, to buy or sell specified quantity of the underlying assets, at a specific (strike) price on or before a specified time (expiration date).

The underlying may be commodities like wheat/ rice/ cotton/ gold/ oil or financial instruments like equity stocks/ stock index/ bonds etc.

- **How are options different from futures?**

The significant differences in Futures and Options are as under:

Futures are agreements/contracts to buy or sell specified quantity of the underlying assets at a price agreed upon by the buyer and seller, on or before a specified time. Both the buyer and seller are obligated to buy/sell the underlying asset. In case of options the buyer enjoys the right but not the obligation, to buy or sell the underlying asset.

All Futures contracts have to be settled on the contract date. However Exchange traded Futures can be settled on or before the settlement date. Options contracts can be settled on or before the settlement date depending on whether they are "American" style or "European" style contracts

Futures contracts prices are affected mainly by the prices of the underlying asset. Prices of options are however, affected by prices of the underlying asset, time remaining for expiry of the contract and volatility of the underlying asset.
It costs basis and initial margin to enter into a futures contract whereas there is a cost of buying an options contract, termed as premium.

- **What are European and American Style of options?**

Options come in two varieties - European vs. American. In a European option, the holder of the option can only exercise his right (if he should so desire) on the expiration date. In an American option, he can exercise this right anytime between purchase date and the expiration date.

- **What are Call Options?**

A call option gives the holder (buyer/ one who is long call), the right to buy specified quantity of the underlying asset at the strike price on or before expiration date.

The seller, however, has the obligation to sell the underlying asset if the buyer of the call option decides to exercise his option to buy.

E.g.

An investor buys One European call option on Infosys at the strike price of Rs. 1500 at a premium of Rs. 100. If the market price of Infosys on the day of expiry is more than Rs. 1600, the option will be exercised.

The investor will earn profits once the share price crosses Rs. 1600 (Strike Price + Premium i.e. 1,500+100).

Suppose the stock price is Rs. 1,800, the option will be exercised and the investor will buy 1 share of Infosys from the seller of the option at Rs 1,500 and sell it in the market at Rs 1,800 making a profit of Rs. 200 ((Spot price - Strike price) - Premium}. However in effect, the buyer of the call option gets the difference between the strike price and spot price from the Exchange whenever he exercises the option.

In another scenario, if at the time of expiry, the stock price falls below Rs. 1,500 say suppose it touches Rs. 1,000, the buyer of the call option will choose not to exercise his option. In this case the buyer loses the premium (Rs 100), paid which shall be the profit earned by the seller of the call option.

- **What are Put Options?**

A Put option gives the holder (buyer/ one who is long Put), the right to sell specified quantity of the underlying asset at the strike price on or before the expiry date.

The seller of the put option (one who is short Put) however, has the obligation to buy the underlying asset at the strike price if the buyer decides to exercise his option to sell.

E.g.

An investor buys one European Put option on Reliance at the strike price of Rs. 2,200, at a premium of Rs. 25. If the market price of Reliance, on the day of expiry is less than Rs. 2,200, the option can be exercised as it is 'in the money'.

The buyer's break-even point is Rs. 2,175 (Strike Price - premium paid) i.e., investor will earn profits if the market falls below 2,175.

Suppose stock price is Rs. 2,160, the buyer of the Put option immediately buys Reliance share in the market @ Rs. 2,160/- & exercises his option selling the Reliance share at Rs 2,200 to the option writer thus making a net profit of Rs. 15 {(Strike price - Spot Price) - Premium paid}. However in effect, the buyer of the put option gets the difference between the strike price and spot price from the Exchange whenever he exercises the option.

In another scenario, if at the time of expiry, market price of Reliance is Rs 2,220, the buyer of the Put option will choose not to exercise his option to sell as he can sell in the market at a higher rate. In this case the investor loses the premium paid (i.e. Rs 25), which shall be the profit earned by the seller of the Put option.

- **What is meant by the term Underlying**

The Underlying is the specific security / asset on which an options contract is based. In case of an Index option, the index (Sensex / Nifty) is the Underlying. In case of an option on Infosys, the Infosys scrip becomes the underlying.

- **What does Option Premium mean?**

It is the price paid by the buyer to acquire the right. This is the amount, which the buyer of the option (whether it is a call or put option) has to pay to the option writer to induce him to accept the risk associated with the contract. In other words it is the price paid to buy the option.

- **What is the Strike Price or Exercise Price?**
  The strike price is the price at which the call / put option is written. The Exchange fixes this price.

- **What is meant by Expiration date?**

An option contract has a finite life. The date on which the option expires is known as Expiration Date.

- **Who is an Option Holder?**

An Option Holder is the one who buys an option, which can be a call, or a put option. He enjoys the right to buy or sell the underlying asset at a specified price on or before specified time.

- **Who is an Option seller/ writer?**

An Option Writer is the one who is obligated to buy (in case of Put option) or to sell (in case of call option), the underlying asset in case the buyer of the option decides to exercise his option.

- **What is meant by the term Assignment?**

When the holder of an option exercises his right to buy/ sell, a randomly selected option seller is assigned the obligation by the Exchange to honor the underlying contract, and this process is termed as Assignment.

- **What is meant by In the Money, At the Money and Out of the money Options.**

An option is said to be 'at-the-money', when the option's strike price is equal to the underlying asset price in the spot market. This is true for both puts and calls.

A call option is said to be in-the-money when the strike price of the option is less than the underlying asset price. For example, a Nifty call option with strike of 4,100 is 'in-the-money', when the spot Nifty is at 4,200 as the call option has value.

The call holder has the right to buy a Nifty at 4,100, no matter how much the spot market price has risen. And with the current price at 4,200, selling the Nifty at this higher price can make a profit.

On the other hand, a call option is out-of-the-money when the strike price is greater than the underlying asset price. Using the earlier example of the Nifty call option, if the Nifty falls to 4,000, the call option no longer has positive exercise value. The call holder will not exercise the option to buy Nifty at 4,100 when the current price is at 4,000.

A put option is in the money when the strike price of the option is greater than the spot price of the underlying asset. For example, a Nifty put at strike of 4,400 is in the money when the Nifty is at 4,100. When this is the case, the put option has value because the put holder can sell the Nifty at 4,400, an amount greater than the current Nifty of 4,100.

Likewise, a put option is out-of-the-money when the strike price is less than the spot price of underlying asset. In the above example, the buyer of Nifty put option won't exercise the option when the spot is at 4,800. The put no longer has positive exercise value.

Options are said to be deep in the money (or deep out-of-the-money) if the exercise price is at significant variance with the underlying asset price.

- **What are Covered and Naked Calls?**

An option contract is said to be a Covered Call Option, when the option is covered or protected by the cash (stock) or Futures position held by the seller of the option.

E.g.

A writer writes a call on Reliance and at the same time holds shares of Reliance so that if the buyer exercises the call, he is protected, as he owns the stock. His stock value would rise in the same proportion.

If a call option is written without owning the underlying stock or a position in Stock Futures, it is called as Naked Call writing.

Covered calls are far less risky than naked calls (where there is no opposite position in the underlying), since the loss on the options can be offset by and equal profit on the cash (Stock) or Futures position.

- **What is the Intrinsic Value of an option?**

The intrinsic value of an option is defined as the amount by which an option is in-the-money, or the immediate exercise value of the option when the underlying position is marked-to-market.

For a call option: **Intrinsic Value = Spot Price - Strike Price**
For a put option: **Intrinsic Value = Strike Price - Spot Price**

The intrinsic value of an option must be a positive number or 0. It cannot be negative. For a call option, the strike price must be less than the price of the underlying asset for the call to have an intrinsic value greater than 0. For a put option, the strike price must be greater than the underlying asset price for it to have intrinsic value.

- **What is Time Value with reference to Options?**

Time value is the amount option buyers are willing to pay for the possibility that the option may become profitable prior to expiration due to favorable change in the price of the underlying. An option loses its time value as its expiration date nears. At expiration, an option is worth only its intrinsic value. Time value cannot be negative.

- **What are the factors that affect the value of an option (premium)?**

There are seven types of factors that affect the value of the option premium:

Quantifiable Factors:

1. Price of the underlying instrument.
2. Strike price.
3. Time remaining till expiration.
4. Risk-free interest rate.
5. Expected volatility.
6. Corporate action like dividend payments, if any.

Non-Quantifiable Factors :

1. Market participants' varying estimates of the underlying asset's future volatility
2. Individuals' varying estimates of future performance of the underlying asset
3. Supply & demand- both in the options marketplace and in the market for the underlying asset
4. "Depth" of the market for that option is the number of transactions and the contract's trading volume on any given day.

- **Who decides on the premium paid on options & how is it calculated?**

The Exchange does not fix options Premium. The fair value/ theoretical price of an option can be known with the help of pricing models and then depending on market conditions the price is determined by competitive bids and offers in the trading environment.

An option's premium / price is the sum of Intrinsic value and time value (explained above). If the price of the underlying stock is held constant, the intrinsic value portion of an option premium will remain constant as well.

Therefore, any change in the price of the option will be entirely due to a change in the option's time value.

The time value component of the option premium can change in response to a change in the volatility of the underlying, the time to expiry, interest rate fluctuations, dividend payments and to the immediate effect of supply and demand for both the underlying and its option.

- **How do options trade get settled?**

Currently options contract is cash settled at the expiry date. An option is a contract, which has a market value like any other tradable commodity. Once an option is bought there are following alternatives that an option holder has:

i. You can sell an option of the same series as the one you had bought and close out /square off your position in that option at any time on or before the expiration.
ii. You can exercise the option on the expiration day in case of European Option or on or before the expiration day in case of an American option. In case the option is 'Out of Money' at the time of expiry, it will expire worthless.

- **What are the risks involved for an options buyer?**

The risk/ loss of an option buyer is limited to the premium that he has paid.

- **What are the costs & risks for an Option writer?**

1. The options writer has to pay initial and market-to-market margins on the value of options (including strike price) sold.
2. The risk of an Options Writer is unlimited where his gains are limited to the premiums earned.
3. The writer of a put option bears a risk of loss if the value of the underlying asset declines below the strike price.
4. The writer of a put bears the risk of a decline in the price of the underlying asset potentially to zero.

Similarly the writer of a call option bears the risk of loss, if the value of the underlying rises beyond the strike price. Theoretically, the loss of an call option writer is unlimited.

- **How can an option writer mitigate his risk?**

The risk of being an option writer may be reduced by the purchase of other options on the same underlying asset thereby assuming a spread position or by acquiring other types of hedging positions in the options/ futures markets.

- **Who can write options in Indian derivatives market?**

In the Indian Derivatives market, any market participant can write options. SEBI has not created any particular category of options writers.

- **What are Index Options?**

The Index Options are options where the underlying asset is a Stock Index for e.g. Options on NSE Nifty/ Options on BSE Sensex etc.

As opposed to options on Individual stocks, index options give an investor the right to buy or sell the value of an index, which represents group of stocks.

- **What are the uses of Index Options?**

Index options enable investors to gain exposure to a broad market, with one trading decision and frequently with one transaction. To obtain the same level of diversification using individual stocks or individual equity options, numerous decisions and trades would be necessary.

- **Who would use index options?**

Index Options are effective enough to appeal to a broad spectrum of users, from conservative individual investors to more aggressive stock market traders.

Individual investors might wish to capitalize on market opinions (bullish, bearish or neutral) by acting on their views of the broad market or one of its many sectors.

To a market professional, managing risks associated with large equity positions may mean using index options to either reduce risk or increase market exposure.

- **What are Options on individual stocks?**
  Options contracts where the underlying asset is an equity stock are termed as Options on stocks.

Basic Option trades:

Long Call

Purchasing calls has remained the most popular strategy with investors since listed options were first introduced. Before moving into more complex bullish and bearish strategies, an investor should thoroughly understand the fundamentals about buying and holding call options.

When to Use?

Bullish Speculation

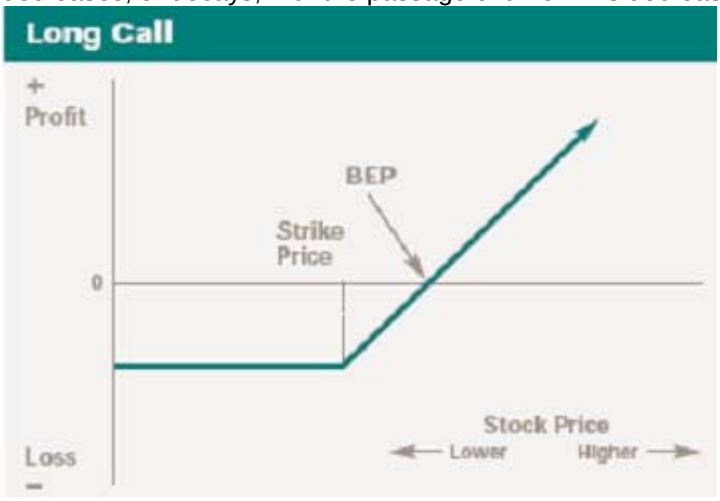
This strategy appeals to an investor who is generally more interested in the amount of his initial investment and the leveraged financial reward that long calls can offer. The primary motivation of this investor is to realise financial reward from an increase in price of the underlying security. Experience and precision are the key to selecting the right option (expiration and/or strike price) for the most profitable result. In general, the more out-of-the-money the call is, the more bullish the strategy, as bigger increases in the underlying stock price are required for the option to reach the break-even point.

Benefit

A long call option offers a leveraged alternative to a position in the stock. As the contract becomes more profitable, increasing leverage can result in large percentage profits because purchasing calls generally requires lower up-front capital commitment than an outright purchase of the underlying stock. Long call contracts offer the investor a predetermined risk.

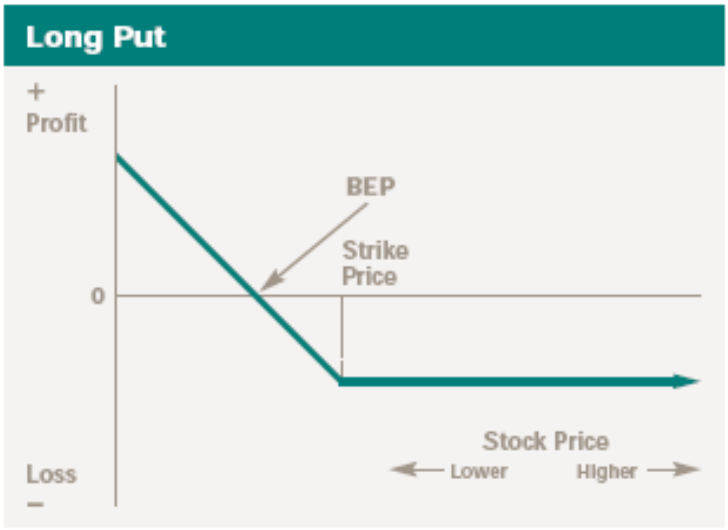
Risk vs. Reward
Maximum Profit: Unlimited
Maximum Loss: Limited to Premium Paid
Upside Profit at Expiration: Stock Price at Expiration – Strike Price – Premium Paid assuming Stock Price Above BEP

Beware:
The time value portion of an option's premium, which the option holder has "purchased" by paying for the option, generally decreases, or decays, with the passage of time. This decrease accelerates as the option contract approaches expiration.



Long Put

A long put can be an ideal tool for an investor who wishes to participate profitably from a downward price move in the underlying stock. Before moving into more complex bearish strategies, an investor should thoroughly understand the fundamentals about buying and holding put options.



When to Use

Purchasing puts without owning shares of the underlying stock is a purely directional strategy used for bearish speculation. The primary motivation of this investor is to realize financial reward from a decrease in price of the underlying security. This investor is generally more interested in the amount of his initial investment and the leveraged financial reward that long puts can offer than in the number of contracts purchased. Buying puts can also be used as an alternative to selling stock short.

Benefit

A long put offers a leveraged alternative to a bearish, or "short sale" of the underlying stock, and offers less potential risk to the investor. As with a long call, an investor who purchased and is holding a long put has predetermined, limited financial risk versus the unlimited upside risk from a short stock sale. Purchasing a put generally requires lower up-front capital commitment than the margin required to establish a short stock position. Regardless of market conditions, a long put will never require a margin call. As the contract becomes more profitable, increasing leverage can result in large percentage profits.

Risk vs. Reward

Maximum Profit: Limited Only by Stock Declining to Zero
Maximum Loss: Limited to Premium Paid
Maximum Profit at Expiration: Strike Price – Stock Price at Expiration – Premium Paid assuming Stock Price Below BEP

Beware:

The maximum profit amount can be limited by the stock's potential decrease to no less than zero. At expiration an in the money put will generally be worth its intrinsic value.

Though the potential loss is predetermined and limited in dollar amount, it can be as much as 100% of the premium initially paid for the put. Whatever your motivation for purchasing the put, weigh the potential reward against the potential loss of the entire premium paid.

The time value portion of an option's premium, which the option holder has "purchased" when paying for the option, generally decreases, or decays, with the passage of time. This decrease accelerates as the option contract approaches expiration. A market observer will notice that time decay for puts occurs at a slightly slower rate than with calls.