FUTURES AND OPTIONS

TRADING in stock index futures contracts was introduced by the Kansas City Board of Trade on February 24, 1982.In April 1982, the Chicago Mercantile Exchange (CME) began trading in futures contract based on the Standard and Poor's Index of 500 common stocks. The introduction of both contracts was successful, especially the S&P 500 futures contract, adopted by most institutional investors.

BSE created history on June 9th, 2000 by launching the first Exchange traded Index Derivative Contract i.e. futures on the capital market benchmark index - the BSE Sensex. The inauguration of trading was done by Prof. J.R. Varma, member of SEBI and chairman of the committee responsible for formulation of risk containment measures for the Derivatives market. The first historical trade of 5 contracts of June series was done on June 9, 2000 at 9:55:03 a.m. between M/s Kaji & Maulik Securities Pvt. Ltd. and M/s Emkay Share & stock Brokers Ltd. at the rate of 4755.

In the sequence of product innovation, the exchange commenced trading in Index Options on Sensex on June 1, 2001. Stock options were introduced on 31 stocks on July 9, 2001 and single stock futures were launched on November 9th 2002.

September 13, 2004 marked another milestone in the history of Indian Capital Markets, the day on which the Bombay Stock Exchange launched Weekly Options, a unique product unparallel in derivatives markets, both domestic and international. BSE permitted trading in weekly contracts in options in the shares of four leading companies namely Reliance, Satyam, State Bank of India, and Tisco in addition to the flagship index-Sensex.

OPTIONS-MEANING

An **option** is a contract whereby one party (the *holder* or buyer) has the right, but not the obligation, to exercise the contract (the option) on or before a future date (the exercise date or expiry). The other party (the *writer* or seller) has the obligation to honour the specified feature of the contract. Since the option gives the buyer a right and the seller an obligation, the buyer has received something of value. The amount the buyer pays the seller for the option is called the option premium.

Because this is a security whose value is determined by an underlying asset, it is classified as a derivative. The idea behind an option is present in everyday situations.

For example, you discover a house that you'd love to purchase. Unfortunately, you don't have the cash to buy it for another three months. You talk to the owner and negotiate a deal that gives you an option to buy the house in three months for a price of Rs.200, 000. The owner agrees, but for this option, you pay a price of Rs.3, 000.

Now, consider two theoretical situations that might arise:

1. It's discovered that the house is actually the true birthplace of a great man. As a result, the market value of the house skyrockets to Rs.1 crore. Because the owner sold you the option, he is obligated to sell you the house for Rs.200, 000. In the end, you stand to make a profit of Rs.97, 97,000 (Rs.1 Crore – Rs.200, 000 – Rs.3, 000).
2. While touring the house, you discover not only that the walls are chock-full of asbestos, but also that a ghost haunts the master bedroom; furthermore, a family of super-intelligent rats have built a fortress in the basement. Though you originally thought you had found the house of your dreams, you now consider it worthless. On the upside, because you bought an option, you are under no obligation to go through with the sale. Of course, you still lose the Rs.3,000 price of the option.

This example demonstrates two very important points. First, when you buy an option, you have a right but not an obligation to do something. You can always let the expiration date go by, at which point the option becomes worthless. If this happens, you lose 100% of your investment, which is the money you used to pay for the option. Second, an option is merely a contract that deals with an underlying asset. For this reason, options are called derivatives, which mean an option derives *i*ts value from something else. In our example, the house is the underlying asset. Most of the time, the underlying asset is a stock or an Index.

REASON FOR USING OPTIONS.

Two main reasons why an investor would use options are:

a. Speculation

Speculation is the betting on the movement of a security. The advantage of options is that one isn't limited to making a profit only when the market goes up. Because of the versatility of options, one can also make money when the market goes down or even sideways.

Speculation is the territory in which the big money is made - and lost. The use of options for making big money or less is the reason why they have the

1. reputation of being risky. This is because when one buys an option; one has to be correct in determining not only the direction of the stock's movement, but also the magnitude and the timing of

this movement. To succeed, one must correctly predict whether a stock will go up or down, and has to be right about how much the price will change as well as the time frame it will take for all this to happen commissions must also be taken into account.

b. **Hedging**

The other function of options is hedging. Think of this as an insurance policy. Just as one insures one's house or car, options can be used to insure the investments against a downturn. By using options, one would be able to restrict one's downslide while enjoying the full upside in a cost-effective way.

WORKING OF OPTIONS

In order to understand the working of options, an assumed firm by the name Justus Company, is taken Let's say that on May 1, the stock price of Justus Co. was Rs.75 and the premium (cost) was Rs.3.15 for a July 78 Call, which indicated that the expiration was the third Friday of July and the strike price was Rs.78. The total price of the contract was Rs.3.15 x 100 = Rs.315. In reality, you'd also have to take commissions into account, but we'll ignore them for this example.

Remember, a stock option contract is the option to buy 100 shares; that's why you must multiply the contract by 100 to get the total price. The strike price of Rs. 78 means that the stock price must rise above Rs.78 before the call option is worth anything; furthermore, because the contract is Rs.3.70 per share, the break-even price would beRs.81.

When the stock price is Rs.67, it's less than the Rs.70 strike price, so the option is worthless. But don't forget that you've paid Rs.315 for the option, so you are currently down by this amount.

Three weeks later the stock price is Rs.84. The options contract has increased along with the stock price and is now worth Rs.6 x 100 = Rs.600. Subtract what you paid for the contract, and your profit is (Rs.3) x 100 = Rs.300. You almost doubled the money in just three weeks! You could sell your options, which are called "closing your position," and take your profits - unless, of course, you think the stock price will continue to rise. For the sake of this example, let's say we let it ride. By the expiration date, the price drops to Rs.60. Because this is less than our Rs.78 strike price and there is no time left, the option contract is worthless. We are now down to the original investment of Rs.300. Putting it in the form of a table: here is what happened to our option investment:

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Date	May 1	May 21	Expiry Date
Stock Price	Rs.78	Rs.84	Rs.60
Option Price	Rs.3	Rs.6	worthless
Contract Value	Rs.300	Rs.600	Rs.0
Paper Gain/Loss	Rs.0	Rs.300	-Rs.300

The price swing for the length of this contract from high to low was Rs.600, which would have given us over double our original investment.
This is leverage in action.

Option frameworks

The buyer pays the price (premium) to the seller (writer).The buyer assumes a long position and the writer a corresponding short position. Thus the writer of a call option is "short a call" and has the obligation to sell to the holder, who is "long of a call option" and who has the right to buy. The writer of a put option is "on the short side of the position", and has the obligation to buy from the taker of the put option, who is "long a put".

The option style determines when the buyer may exercise the option which will affect the valuation. Generally the contract will either be **American style** - which allows exercise up to the expiry date - or **European style** - where exercise is only allowed on the expiry date - or **Bermudian style** - where exercise is allowed on several, specific dates up to the expiry date. European contracts are easier to value.

Buyers and sellers of exchange-traded options do not usually interact directly - the futures and options exchange acts as intermediary. The seller guarantees the exchange to fulfill his obligation if the buyer chooses to execute.

The risk for the option holder is limited: he cannot lose more than the premium paid as he can "abandon the option". His potential gain with a call option is theoretically unlimited;

The maximum loss for the writer of a put option is equal to the strike price. In general, the risk for the writer of a call option is unlimited. However, an option writer who owns the underlying instrument has created a covered position; he can always meet his obligations by using the actual

underlying. Where the seller does not own the underlying on which he has written the option, he is called a "naked writer", and has created a "naked position".

Options can be in-the-money, at-the-money or out-of-the-money. The "in-the-money" option has a positive intrinsic value, options in "at-the-money" or "out-of-the-money" have an intrinsic value of zero. Additional to the intrinsic value an option has a time value, which decreases when the option is closer to its expiry date.

TYPES OF OPTIONS

The main types of options are:

- **American options** can be exercised at any time between the date of purchase and the expiration date.
- **European options** can only be exercised at the end of their lives.
- **Long-Term Options** are options with holding times of one, two or multiple years, which may be more appealing for long-term investors, which are called long-term equity anticipation securities (LEAPS). By providing opportunities to control and manage risk or even to speculate, LEAPS are virtually identical to regular options. LEAPS, however, provide these opportunities for much longer periods of time. Although they are not available on all stocks, LEAPS are available on most widely held issues.
- **Real option** is a choice that an investor has when investing in the real economy - in the production of goods or services, rather than in financial contracts – which may be something as simple as the opportunity to expand production, or to change production inputs. They are an increasingly influential tool in corporate finance with typically difficult or impossible to trade **Traded options** (also called "Exchange-Traded Options" or "Listed Options") are Exchange traded derivatives which have: standardized contracts; quick systematic pricing; and are settled through a clearing house (ensuring fulfillment.) These include: stock options; bond options; interest rate options; and swaption.
- **Vanilla options** are 'simple', well understood and traded options, whereas an exotic option is more complex, or less easily understood and non-standard in nature. Asian options, look back options, barrier options are considered to be exotic, especially if the underlying instrument is more complex than simple equity or debt.
- **Employee stock options** are issued by a company to its employees as compensation.

PRICING OF OPTIO

Factors affecting the Option premium:

Options are used as risk management tools and the valuation or pricing of the instruments is a careful balance of market factors.

There are four major factors affecting the Option premium:

1. Price of Underlying
2. Time to Expiry
3. Exercise Price Time to Maturity
4. Volitility of the Underlying, and

Two less important factors:

1. Short – Term Interest Rates
2. Dividends

The Intrinsic Value of an Option

The intrinsic value of an option is defined as the amount by which an option is in-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 positive or zero. 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.

Comparing two calls with the same underlying asset; the higher the exercise price of a call, the *lower* its premium.

Comparing two puts with the same underlying asset; the higher the exercise price of a put, the *higher* its premium.

b. Price of Underlying

The premium is affected by the price movements in the underlying instrument. For Call options the right to buy the underlying at a fixed strike price – as the underlying price raises so does its premium. As the underlying price falls so does the cost of the option premium. For put options – the right to sell the underlying at a fixed strike price as the underlying price rises, the premium falls; as the underlying price decreases the premium cost raises.

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Call options become more valuable as the stock price increases and less valuable as the strike price increases. For a put option, the payoff on exercise is the amount by which the strike price exceeds

the stock price. Put options, therefore, behave in the opposite way to call options. They become less valuable as the stock price increases and more valuable as the strike price increases.

c. The Time Value of an Option

Generally, the longer the time remaining until an option's expiration, the higher will be its premium, because the longer an option's lifetimes, greater is the possibility that the underlying share price might move so as to make the option in-the-money. All other factors affecting an option's price remaining the same, the time value portion of an option's premium will decrease with the passage of time.

d. Volatility

Volatility is the tendency of the underlying security's market price to fluctuate either up or down. It reflects a price change's magnitude; it does not imply a bias towards price movement in one direction or the other. Thus, it is a major factor in determining an option's premium. The higher the volatility of the underlying stock, the higher the premium because there is a greater possibility that the option will move in-the-money. Generally, as the volatility of an under-lying stock increases, the premiums of both calls and puts overlying that stock increase, and vice versa.

Higher volatility = Higher premium
Lower volatility = Lower premium

e. Interest rates

In general interest rates have the least influence on options and equate approximately to the cost of carry of a futures contract. If the size of the options contract is very large, then this factor may take on some importance. All other factors being equal as interest rates rise, premium costs fall and vice versa. The relationship can be thought of as an opportunity cost. In order to buy an option, the buyer must either borrow funds or use funds on deposit. Either way the buyer incurs an interest rate cost. If interest rates are rising, then the opportunity cost of buying options increases and to compensate the buyer premium costs fall. Why should the buyer be compensated? Because the option writer receiving the premium can place the funds on deposit and receive more interest than was previously anticipated. The situation is reversed when interest rates fall -premiums rise. This time it is the writer who needs to be compensated.

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As interest rates in the economy increases, the expected growth rate of the stock price tends to increase and the present value of any future cash flows received by the holder of the option decreases. These two effects tend to decrease the value of a put option and hence, put option prices decline as the risk-free interest rate increases. In the case of calls, the first effect tends to increase the price and the second effect tends to decrease it. It can be shown that the first effect always dominates the second effect; that the price of a call always increases as the risk-free interest rate increases.

The higher the "riskless interest rate", the higher the call premium. The higher the "riskless interest rate", the lower the put premium

f. Dividends

Dividends have the effect of reducing the stock price on the ex-dividend date. The value of a call option is negatively related to the size of any anticipated dividend and the value of a put option is positively related to the size of any anticipated dividend.

option zones

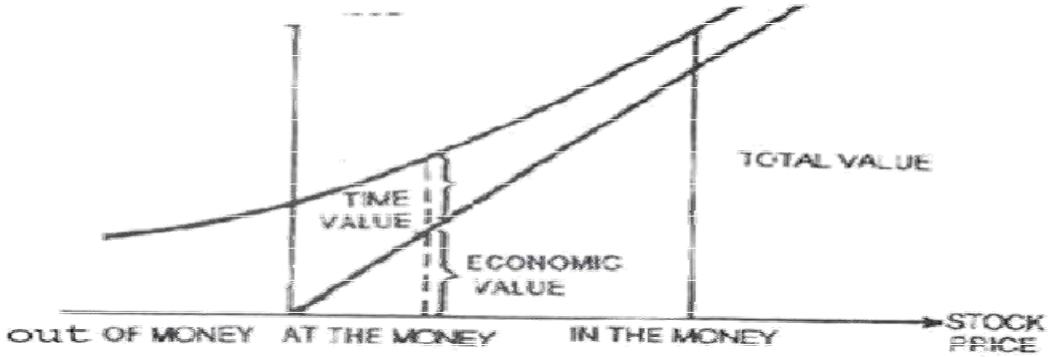
The value of the stock option has three different zones, as shown below:

Out of the Money: Where the stock price is below the exercise price.

At the Money: Where it is close to or at the exercise price.

In the Money: Where the stock price is above the exercise price.

These zones are depicted in the chart below:



Say the exercise price is Rs.60. If the stock price is below 60, there is no economic value. There is only time value; if stock price starts above Rs.60 it will have been economic value and time value. As seen from the chart time value is maximum, when the exercise price and stock price are the same but is lower below the exercise price or above it. If the actual price is lower than the exercise price there is less change of profit on the call. If the actual price is above the exercise price, then there is a chance of profit, and there is less reason to pay a premium over the economic value (intrinsic value)

Straddle

One popular combination is a *straddle,* which involves buying a call and a put with the same strike price and expiration date. If the stock price is close to this strike price at expiration of the options, the straddle leads to a loss. However, if there is a sufficiently large move in either direction, a significant profit will result.

Strips and Strops

A strip consists of a long position in one call and two puts with the same strike price and one put with the same price and expiration data. A strap consists of a long position in two calls and one put with the same strike price and expiration data. In a strip the trader is betting that there will be a big stock price move and considers a decrease in the stock price to be more likely than an increase. In a strap the trader is also betting that there will be a big stock price move. However, in a strap the trader is also betting that there will be a big stock price move. However, in this case, an increase in the stock price is considered to be more likely than a decrease.

FUTURES CONTRACT-MEANING

A futures contract is a type of derivative instrument, or financial contract, in which two parties agree to transact a set of financial instruments or physical commodities for future delivery at a particular price. If one buys a futures contract, he is basically agreeing to buy something that a seller has not yet produced for a set price. But participating in the futures market does not necessarily mean that he will be responsible for receiving or delivering large inventories of physical commodities, instead, buyers and sellers in the futures market primarily enter into futures contracts to hedge risk or speculate rather than to exchange physical goods (which is the primary activity of the cash/spot market). That is why futures are used as financial instruments by not only producers and consumers but also speculators.

The consensus in the investment world is that the futures market is a major financial hub, providing an outlet for intense competition among buyers and sellers and, more importantly, providing a center to manage price risks. The futures market is extremely liquid, risky and complex by nature, but can be understood.

FUTURES CHARACTERISTICS

Margins

In the futures market, margin has a definition distinct from its definition in the stock market, where margin is the use of borrowed money to purchase securities. In the futures market, margin refers to the initial deposit of "good faith" made into an account in order to enter into a futures contract. This margin is referred to as good faith because it is this money that is used to debit any day-to-day losses.

When one opens a futures contract, the futures exchange will state a minimum amount of money that one must deposit into ones account which is called the initial margin. When the contract is liquidated, the initial margin plus or minus any gains or losses that occur over the span of the futures contract will be refunded. The minimum-level margin is determined by the futures exchange and is usually 5% to 10% of the futures contract. These predetermined initial margin amounts are continuously under review: at times of high market volatility, initial margin requirements can be raised.
The initial margin is the minimum amount required to enter into a new futures contract, but the maintenance margin is the lowest amount an account can reach before needing to be replenished. For example, if your margin account drops to a certain level because of a series of daily losses, brokers are required to make a margin call and request that you make an additional deposit into your account to bring the margin back up to the initial amount.
When a margin call is made, the funds usually have to be delivered immediately. If they are not, the brokerage can have the right to liquidate your position completely in order to make up for any losses it may have incurred on your behalf.

Leverage

In the futures market, leverage refers to having control over large cash amounts of commodities with comparatively small levels of capital. In other words, with a relatively small amount of cash, you can enter into a futures contract that is worth much more than you initially have to pay (deposit into your margin account). It is said that in the futures market, more than any other form of investment, price changes are highly leveraged, meaning a small change in a futures price can translate into a huge gain or loss.
Futures positions are highly leveraged because the initial margins that are set by the exchanges are relatively small compared to the cash value of the contracts in question (which is part of the reason why the futures market is useful but also very risky). The smaller the margin in relation to the cash value of the futures contract, the higher the leverage.
As a result of leverage, if the price of the futures contract moves up even slightly, the profit gain will be large in comparison to the initial margin. However, if the price just inches downwards, that same high leverage will yield huge losses in comparison to the initial margin deposit.

Pricing and Limits

Futures prices have a price change limit that determines the prices between which the contracts can trade on a daily basis. The price change limit is added to and subtracted from the previous day's close and the results remain the upper and lower price boundary for the day.
The exchange can revise this price limit if it feels it's necessary. It's not uncommon for the exchange to abolish daily price limits in the month that the contract expires (delivery or "spot" month). This is because trading is often volatile during this month, as sellers and buyers try to obtain the best price possible before the expiration of the contract.
In order to avoid any unfair advantages, the futures exchanges impose limits on the total amount of contracts or units of a commodity in which any single person can invest. These are known as position limits and they ensure that no one person can control the market price for a particular commodity.
Stock index futures are traded in terms of number of contracts. Each contract is to buy or sell a fixed value of the index. The value of the index is defined as the value of the index multiplied by the specified monetary amount. The monetary value is fixed by the exchange where the contract is traded.

An index future is a future on the index i.e. the underlying is the index itself and no underlying security or a stock, which is to be delivered to fulfill the obligations. Index futures are cash settled. As other derivatives, the contract derives its value from the underlying index. The underlying indices in this case will be the various eligible indices and as permitted by the Regulator from time to time.

IMPORTANCE OF INDEX FUTURES

Technical analysts thrive on their ability to predict the movement of the broad market indices. However, as they cannot trade the index, the normal practice is to try to capture a relation between the index and individual stocks. The introduction of the futures contract on stock indices gives them the opportunity to actually buy into the components of the index.

The other important use of stock index futures is for hedging. Mutual funds and other institutional investors are the main beneficiaries. Hedging is a technique by which such institutions can protect their portfolios from market risks. There are three different views in the literature on the nature and purpose of hedging:

- Risk minimisation.
- Profit maximisation.
- Reaching a satisfactory risk-return trade-off using a portfolio.