FINANCIAL DERIVATIVES VI SEMESTER

Core Course : BCM6 B15

B.COM SPECIALISATION

(2019 Admission Onwards)



UNIVERSITY OF CALICUT

School of Distance Education, Calicut University P.O., Malappuram - 673 635, Kerala.



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Study Material

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BCM6 B15-FINANCIAL DERIVATIVES

Prepared by:

Sri. Rajan P Assistant Professor of Commerce School of Distance Education University of Calicut

Scrutinized By:

Dr. Rijila P T

Assistant Professor on Contract School of Distance Education University of Calicut

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CONTENTS

Modules	Contents	Page
		Number
Module 1	Introduction to Financial	
	Derivatives	05-22
Module 2	Derivative Market	23-37
Module 3	Forwards and Futures	38-67
Module 4	Options	68-104
Module 5	Swaps	105-115

MODULE 1 INTRODUCTION OF FINANCIAL DERIVATIVES

The objective of an investment decision is to get required rate of return with minimum risk. To achieve this objective, various instruments, practices and strategies have been devised and developed in the recent past. With the opening of boundaries for international trade and business, the world trade gained momentum in the last decade, the world has entered into a new phase of global integration and liberalisation. The integration of capital markets world-wide has given rise to increased financial risk with the frequent changes in the interest rates, currency exchange rate and stock prices. To overcome the risk arising out of these fluctuating variables and increased dependence of capital markets of one set of countries to the others, risk management practices have also been reshaped by inventing such instruments as can mitigate the risk element. These new popular instruments are known as financial derivatives which, not only reduce financial risk but also open us new opportunity for high risk takers.

Definition of derivatives

Literal meaning of derivative is that something which is derived. Now question arises as to what is derived? From what it is derived? Simple one line answer is that value/price is derived from any underlying asset. The term 'derivative' indicates that it has no independent value, i.e., its value is entirely derived from the value of the underlying asset. The underlying asset can be securities, commodities, bullion, currency, livestock or anything else. The Securities Contracts (Regulation) Act 1956 defines 'derivative' as under:

'Derivative' includes-

Security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security. A contract which derives its value from the prices, or index of prices of underlying securities. There are two types of derivatives. Commodity derivatives and financial derivatives. Firstly derivatives originated as a tool for managing risk in commodities markets. In commodity derivatives, the underlying asset is a commodity. It can be agricultural commodity like wheat, soybeans, rapeseed, cotton etc. or precious metals like gold, silver etc. The term financial derivative denotes a variety of financial instruments including stocks, bonds, treasury bills, interest rate, foreign currencies and other hybrid securities. Financial derivatives include futures, forwards, options, swaps, etc. Futures contracts are the most important form of derivatives, which are in existence long before the term 'derivative' was coined. Financial derivatives can also be derived from a combination of cash market instruments or other financial derivative instruments. In fact, most of the financial derivatives are not new instruments rather they are merely combinations of older generation derivatives and/or standard cash market instruments.

Evolution of derivatives

It is difficult to trace out origin of futures trading since it is not clearly established as to where and when the first forward market came into existence. Historically, it is evident that futures markets were developed after the development of forward markets. It is believed that the forward trading was in existence during 12th century in England and France. Forward trading in rice was started in 17th century in Japan, known as Cho-at-Mai a kind (rice trade-on-book) concentrated around Dojima in Osaka, later on the trade in rice grew with a high degree of standardization. In 1730, this market got official recognition from the Tokugawa Shogurate. As such, the Dojima rice market became the first futures market in the sense that it was registered on organized exchange with the standardized trading norms. The butter and eggs dealers of Chicago Produce Exchange joined hands in 1898 to form the Chicago Mercantile Exchange for futures trading. The exchange provided a futures market for many commodities including pork bellies (1961), live cattle (1964), live hogs (1966), and feeder cattle (1971). The International Monetary Market was formed as a division of the Chicago Mercantile Exchange in 1972 for futures trading in foreign currencies. In 1982, it introduced a futures contract on the S&P 500 Stock Index. Many other exchanges throughout the world now trade futures contracts. Among these are the Chicago Rice and Cotton Exchange, the New York Futures Exchange, the London International Financial Futures Exchange, the Toronto Futures Exchange and the Singapore International Monetary Exchange. During 1980's, markets developed for options in foreign exchange, options on stock indices, and options on futures contracts. The Philadelphia Stock Exchange is the premier exchange for trading foreign exchange options. The Chicago Board Options Exchange trades options on the S&P 100 and the S&P 500 stock indices while the American Stock Exchange trades options on the Major Market Stock Index, and the New York Stock Exchange trades options on the NYSE Index. Most exchanges offering futures contracts now also offer options on these futures contracts. Thus, the Chicago Board of Trades offers options on commodity futures, the Chicago Mercantile Exchange offers options on live cattle futures, the International Monetary Market offers options on foreign currency futures, and so on.

The basic cause of forward trading was to cover the price risk. In earlier years, transporting goods from one market to other markets took many months. For example, in the 1800s, food grains produced in England sent through ships to the United States which normally took few months. Sometimes, during this time, the price trembled due to unfavorable events before the goods reached to the destination. In such cases, the producers had to sell their goods at loss. Therefore, the producers sought to avoid such price risk by selling their goods forward, or on a "to arrive" basis. The basic idea behind this move at that time was simply to cover future price risk. On the opposite side, the speculator or other commercial firms seeking to offset their price risk came forward to go for such trading. In this way, the forward trading in commodities came into existence. In the beginning, these forward trading agreements were formed to buy and sell food grains in the future for actual delivery at the pre-determined price. Later on these agreements became transferable, and during the American Civil War period, Le., 1860 to 1865, it became common place to sell and resell such agreements where actual delivery of produce was not necessary. Gradually, the traders realized that the agreements were easier to buy and sell if the same were standardized in terms of quantity, quality and place of delivery relating to food grains. In the nineteenth century this activity was centred in Chicago which was the main food grains marketing centre in the United States. In this way, the modern futures contracts first came into existence with the establishment of the Chicago Board of Trade (CBOT) in the year 1848, and today, it is the largest futures market of the world. In 1865, the CBOT framed the general rules for such trading which later on became a trendsetter for so many other markets. In 1874, the Chicago Produce Exchange was established which provided the market for butter, eggs, poultry, and other perishable agricultural products. In the year 1877, the London Metal Exchange came into existence, and today, it is leading market in metal trading both in spot as well as forward. In the year 1898, the butter and egg dealers withdrew from the Chicago Produce Exchange to form separately the Chicago Butter and Egg Board, and thus, in 1919 this exchange was renamed as the Chicago Mercantile Exchange (CME) and was reorganized for futures trading. Since then, so many other exchanges came into existence throughout the world which trade in futures contracts. Although financial derivatives have been is operation since long, but they have become a major force in financial markets in the early 1970s. The basic reason behind this development was the failure of Brettonwood System and the fixed exchange rate regime was broken down. As a result, new exchange rate regime, i.e., floating rate (flexible) system based upon market forces came into existence. But due to pressure or demand and supply on different currencies, the exchange rates were constantly changing, and often, substantially. As a result, the business firms faced a new risk, known as currency or foreign exchange risk. Accordingly, a

new financial instrument was developed to overcome this risk in the new financial environment. Another important reason for the instability in the financial market was fluctuation in the short-term interests. This was mainly due to that most of the government at that time tried to manage foreign exchange fluctuations through short-term interest rates and by maintaining money supply targets, but which were contrary to each other. Further, the increased instability of short-term interest rates created adverse impact on long-term interest rates, and hence, instability in bond prices, because they are largely determined by long-term interest rates. The result is that it created another risk, named interest rate risk, for both the issuers and the investors of debt instruments. Interest rate fluctuations had not only created instability in bond prices, but also in other long-term assets such as, company stocks and shares.

Share prices are determined on the basis of expected present values of future dividend payments discounted at the appropriate discount rate. Discount rates are usually based on long-term interest rates in the market. So increased instability in the longterm interest rates caused enhanced fluctuations in the share prices in the stock markets. Further volatility in stock prices is reflected in the volatility in stock market indices which causes systematic risk or market risk. In the early 1970s, it is witnessed that the financial markets were highly instable, as a result, so many financial derivatives have been emerged as the means to manage the different types of risks stated above, and also for taking advantage of it. Hence, the first financial futures market was the International Monetary Market, established in 1972 by the Chicago Mercantile Exchange which was followed by the London International Financial Futures Exchange in 1982. The Forwards Con-

tracts (Regulation) Act, 1952, regulates the forward/futures contracts in commodities all over India. As per this the Forward Markets Commission (FMC) continues to have jurisdiction over commodity forward/futures contracts. However when derivatives trading in securities was introduced in 2001, the term 'security' in the Securities Contracts (Regulation) Act, 1956 (SCRA), was amended to include derivative contracts in securities. Consequently, regulation of derivatives came under the preview of Securities Exchange Board of India (SEBI). We thus have separate regulatory authorities for securities and commodity derivative markets.

Features of financial derivatives

- 1. **It is a contract**: Derivative is defined as the future contract between two parties. It means there must be a contract-binding on the underlying parties and the same to be fulfilled in future. The future period may be short or long depending upon the nature of contract, for example, short term interest rate futures and long term interest rate futures contract.
- 2. Derives value from underlying asset: Normally, the derivative instruments have the value which is derived from the values of other underlying assets, such as agricultural commodities, metals, financial assets, intangible assets, etc. Value of derivatives depends upon the value of underlying instrument and which changes as per the changes in the underlying assets, and sometimes, it may be nil or zero. Hence, they are closely related.
- 3. **Specified obligation:** In general, the counter parties have specified obligation under the derivative contract. Obviously,

the nature of the obligation would be different as per the type of the instrument of a derivative. For example, the obligation of the counter parties, under the different derivatives, such as forward contract, future contract, option contract and swap contract would be different.

- 4. Direct or exchange traded: The derivatives contracts can be undertaken directly between the two parties or through the particular exchange like financial futures contracts. The exchange-traded derivatives are quite liquid and have low transaction costs in comparison to tailor-made contracts. Example of exchange traded derivatives are Dow Jons, S&P 500, Nikki 225, NIFTY option, S&P Junior that are traded on New York Stock Exchange, Tokyo Stock Exchange, National Stock Exchange, Bombay Stock Exchange and so on.
- 5. **Related to notional amount:** In general, the financial derivatives are carried off-balance sheet. The size of the derivative contract depends upon its notional amount. The notional amount is the amount used to calculate the payoff. For instance, in the option contract, the potential loss and potential payoff, both may be different from the value of underlying shares, because the payoff of derivative products differ from the payoff that their notional amount might suggest.
- 6. **Delivery of underlying asset not involved:** Usually, in derivatives trading, the taking or making of delivery of underlying assets is not involved, rather underlying transactions are mostly settled by taking offsetting positions in the derivatives themselves. There is, therefore, no effective limit on the

quantity of claims, which can be traded in respect of underlying assets.

- 7. May be used as deferred delivery: Derivatives are also known as deferred delivery or deferred payment instrument. It means that it is easier to take short or long position in derivatives in comparison to other assets or securities. Further, it is possible to combine them to match specific, i.e., they are more easily amenable to financial engineering.
- 8. Secondary market instruments: Derivatives are mostly secondary market instruments and have little usefulness in mobilizing fresh capital by the corporate world, however, warrants and convertibles are exception in this respect.
- 9. **Exposure to risk:** Although in the market, the standardized, general and exchange-traded derivatives are being increasingly evolved, however, still there are so many privately negotiated customized, over-the-counter (OTC) traded derivatives are in existence. They expose the trading parties to operational risk, counter-party risk and legal risk. Further, there may also be uncertainty about the regulatory status of such derivatives.
- 10. **Off balance sheet item:** Finally, the derivative instruments, sometimes, because of their off-balance sheet nature, can be used to clear up the balance sheet. For example, a fund manager who is restricted from taking particular currency can buy a structured note whose coupon is tied to the performance of a particular currency pair.

Types of financial derivatives

Derivatives are of two types: financial and commodities.



One form of classification of derivative instruments is between commodity derivatives and financial derivatives. The basic difference between these is the nature of the underlying instrument or asset. In a commodity derivative, the underlying instrument is a commodity which may be wheat, cotton, pepper, sugar, jute, turmeric, corn, soyabeans, crude oil, natural gas, gold, silver, copper and so on. In a financial derivative, the underlying instrument may be treasury bills, stocks, bonds, foreign exchange, stock index, gilt-edged securities, cost of living index, etc. It is to be noted that financial derivative is fairly standard and there are no quality issues whereas in commodity derivative, the quality may be the underlying matter. However, despite the distinction between these two from structure and functioning point of view, both are almost similar in nature.

The most commonly used derivatives contracts are forwards, futures and options.

Forwards: A forward contract is a customised contract between two entities, where settlement takes place on a specific date in the future at today's pre-agreed price. For example, an Indian car manufacturer buys auto parts from a Japanese car maker with payment of one million yen due in 60 days. The importer in India is short of yen and suppose present price of yen is Rs. 68. Over the next 60 days, yen may rise to Rs. 70. The importer can hedge this exchange risk by negotiating a 60 days forward contract with a bank at a price of Rs. 70. According to forward contract, in 60 days the bank will give the importer one million yen and importer will give the banks 70 million rupees to bank.

Futures: A futures contract is an agreement between two parties to buy or sell an asset at a certain time in the future at a certain price. Futures contracts are special types of forward contracts in the sense that the former are standardised exchange-traded contracts. A speculator expects an increase in price of gold from current future prices of Rs. 9000 per 10 gm. The market lot is 1 kg and he buys one lot of future gold (9000 \times 100) Rs. 9,00,000. Assuming that there is 10% margin money requirement and 10% increase occur in price of gold. the value of transaction will also increase i.e. Rs. 9900 per 10 gm and total value will be Rs. 9,90,000. In other words, the speculator earns Rs.90,000.

Options: Options are of two types– calls and puts. Calls give the buyer the right but not the obligation to buy a given quantity of the

underlying asset, at a given price on or before a given future date. Puts give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on or before a given date.

Warrants: Options generally have lives of upto one year, the majority of options traded on options exchanges having maximum maturity of nine months. Longer-dated options are called warrants and are generally traded over-the-counter.

Leaps: The acronym LEAPS means long term equity anticipation securities. These are options having a maturity of upto three years.

Baskets: Basket options are options on portfolios of underlying assets. The index options are a form of basket options.

Swaps: Swaps are private agreements between two parties to exchange cash flows in the future according to a prearranged formula. They can be regarded as portfolios of forward contracts. The two commonly used swaps are:

- Interest rate swaps: These entail swapping only the interest related cash flows between the parties in the same currency
- Currency Swaps: These entail swapping both principal and interest on different currency than those in the opposite direction.

Swaptions: Swaptions are options to buy or sell a swap that will become operative at the expiry of the options. Thus a swaptions is an option on a forward swap. Rather than have calls and puts, the swaptions market has receiver swaptions and payer swaptions. A receiver swaption is an option to receive fixed and pay floating. A payer swaption is an option to pay fixed and receive floating.-

Uses of derivatives

Derivatives are supposed to provide the following services:

1. **Risk aversion tools**: One of the most important services provided by the derivatives is to control, avoid, shift and manage efficiently different types of risks through various strategies like hedging, arbitraging, spreading, etc.

Derivatives assist the holders to shift or modify suitably the risk characteristics of their portfolios. These are specifically useful in highly volatile financial market conditions like erratic trading, highly flexible interest rates, volatile exchange rates and monetary chaos.

2. **Prediction of future prices**: Derivatives serve as barometers of the future trends in prices which result in the discovery of new prices both on the spot and futures markets. Further, they help in disseminating different information regarding the futures markets trading of various commodities and securities to the society which enable to discover or form suitable or correct or true equilibrium prices in the markets. As a result, they assist in appropriate and superior allocation of resources in the society.

3. Enhance liquidity: As we see that in derivatives trading no immediate full amount of the transaction is required since most of them are based on margin trading. As a result, large number of traders, speculators arbitrageurs operate in such markets. So, derivatives trading enhance liquidity and reduce transaction costs in the markets for underlying assets.

4. **Assist investors:** The derivatives assist the investors, traders and managers of large pools of funds to devise such strategies so that they may make proper asset allocation increase their yields and achieve other investment goals.

5. **Integration of price structure**: It has been observed from the derivatives trading in the market that the derivatives have smoothen out price fluctuations, squeeze the price spread, integrate price structure at different points of time and remove gluts and shortages in the markets.

6. **Catalyse growth of financial markets**: The derivatives trading encourage the competitive trading in the markets, different risk taking preference of the market operators like speculators, hedgers, traders, arbitrageurs, etc. resulting in increase in trading volume in the country. They also attract young investors, professionals and other experts who will act as catalysts to the growth of financial markets.

7. **Brings perfection in market**: Lastly, it is observed that derivatives trading develop the market towards 'complete markets'. Complete market concept refers to that situation where no particular investors can be better off than others, or patterns of returns of all additional securities are spanned by the already existing securities in it, or there is no further scope of additional security.

Economic functions of Derivative contracts

Derivative contracts perform a number of economic functions. Important functions may be outlined as below:-

1. Risk management functions

This is the primary function of derivatives. Derivatives shift the risk from the buyer of the derivative product to the seller. Thus, derivatives are very effective risk management tools. Most of the world's 500 largest companies use derivates to lower risk.

2. Price discovery function:-

This refers to the ability to achieve and disseminate price information. Without price information, investors, consumers, and producers cannot make informed decisions. They cannot direct their capital to efficient uses. Derivatives are exceptionally well suited for providing price information. They are the tools that assist everyone in the market place to determine value. The wider the use of derivatives, the wider the distribution of price information.

3. Liquidity function

Derivatives contract improve the liquidity of the underlying instruments. They provide better avenues for raising money. They contribute sustainability to increasing the depth of the markets. Derivative markets often have greater liquidity than the spot markets, this higher liquidity is at lest partly due to the smaller amount of capital required for participation in derivative markets. Since the capital required is less, more participants will operate in the market. This leads to increased volume of trade and liquidity.

4. Efficiency function

Derivatives significantly increase market liquidity, as a result, transactional costs are lowered, the efficiency in doing business is increased, the cost of raising capital investment is expanded.

5. Portfolio management function

Derivatives help in efficient portfolio management. With a smaller fund at disposal, better diversification can be achieved. Derivatives provide much wider menu to portfolio managers who constantly seek better risk return trade off.

6. Economic development function

Bright, creative, well educated people with an entrepreneurial attitude will be attracted towards the derivative markets. Derivative markets energise other to create new businesses, new products and new employment opportunities. Derivative markets help increase savings and investment in the long run.

Disadvantages of Derivatives

1. High volatility:

Since the value of derivatives is based on certain underlying things such as commodities, metals and stocks etc., they are exposed to high risk. Most of the derivatives are traded on open market. And the prices of these commodities metals and stocks will be continuously changing in nature. So the risk that one may lose their value is very high.

2. Requires expertise:

In case of mutual funds or shares one can manage with even a limited knowledge pertaining to his sector of trading. But in case of derivatives it is very difficult to sustain in the market without expert knowledge in the field.

3. Contract life:

The main problem with the derivative contracts is their limited life. As the time passes the value of the derivatives will decline and so on. So one may even have chances of losing completely within that agreed time frame.

Risk Involved in derivatives

1. Counterparty Risk

About three quarters of the derivatives contracts across the world

are entered over the counter. This means that there is no exchange involved and hence there is a probability that the counterparty may not be able to fulfill its obligations. This gives rise to the most obvious type of risk associated with derivatives market i.e. counterparty risk.

2. Price Risk

Derivatives being traded on the securities exchange are a relatively new phenomenon. Hence, all participants including the most seasoned ones are clueless as to what should the pricing of these derivatives be. The market is functioning in terms of superior knowledge relative to peers. Hence, there is always a risk that the majority of the market may be mispricing these derivatives and may cause large scale default. This has already happened in an infamous incident including the company called "Long Term Capital Management (LTCM)". LTCM became part of a trillion dollar default and became a prime example as to how even the smartest management may end up wrongly guessing the price of derivatives.

3. Agency Risk

A very less talked about problem pertaining to derivatives market is that of agency risks. Agency risk simply means that if there is a principal and an agent, the agent may not act in the best interest of the principal because their objectives are different from that of the principal. In this scenario it would mean that if a derivative trader is acting on behalf of a multinational corporation or a bank, the interests of the organization and that of the individual employee who is authorized to make decisions may be different.

This may seem like a small problem. However, if we consider what happened at companies like Barings Bank and Proctor and Gamble then the true picture emerges.

4. Systemic Risk

Systemic risk pertaining to derivatives is widely spoken about. Yet it seems to be less understood and almost never quantified. System risk refers to the probability of widespread default in all financial markets because of a default that initially started in derivative markets. In simple words, this is the belief that because derivatives are so volatile, one major default can cause cascading defaults throughout the derivatives market. These cascading defaults will then spin out of control and enter the financial domain in general threatening the existence of the entire financial system. This view has been prevalent for a long time. However, it was often dismissed as a silly doomsday prediction. In 2008, most people found out that it wasn't that silly and farfetched at all.

MODULE 2 DERIVATIVE MARKETS

The derivatives are most modern financial instruments for hedging risk. The individuals and firms who wish to avid or reduce risk can deal with the others who are willing to accept the risk for a price. A common place where such transactions take place is called the derivative market.

Meaning and definition of derivative markets

Initially, derivative started in an unorganized market. But, now, there exists an organized market as well. Organized market does not mean undeveloped market. It refers to over the counter market, in which the buyers and sellers come in contract directly with each other or through an intermediary. They mutually decide about all the terms and conditions of the contract and both commit to fulfil and abide by the set of terms. Thus derivative market is a market in which derivatives are traded. In short, it is a market for derivatives. The traders in the derivative markets are hedgers, speculators and arbitrageurs.

Importance of Derivative markets

- 1. It increases the volume of transactions.
- 2. In derivative markets, the transaction cost are lower
- 3. The risk of holding underlying assets is lower
- 4. It gives increased liquidity for investors
- 5. It leads to faster execution of transactions

- 6. It enhances the price discovery process
- 7. It facilitates the transfer of risk from risk averse investors to risk takers.
- 8. It increases the savings and investments in the economy.

Hedging

Hedging is a technique of managing the risk attached to assets including foreign exchanges. In short, hedging means covering or eliminating or reducing the risk. Hedging is done with derivatives.

Major players or participants of Derivative markets

The derivatives market is growing considerably all over the world. The main reason is that they have attracted many types of traders having a great deal of liquidity. When an investor wants to take one side of contract, there is usually no problem in finding someone that is prepared to take the other side. The different traders active in the derivatives market can be categorized into three parts:

1. Hedgers

Hedging is an activity to reduce risk and hedger is someone who faces risk associated with price movement of an asset and who uses derivatives as a means of reducing that risk. A hedger is a trader who enters the futures market to reduce a preexisting risk. For example, an importer imports some goods from USA for \$ 100 and the payment is to be made after three months. Suppose, today the dollar-price quote is 1 \$= Rs. 45. Therefore, if the payment is to be made today, the cost of goods in Indian currency will be Rs. 4500. But due to uncertainty in future movement in prices, there may be chance of

dollar appreciation thereby increasing the cost of goods for the importer. In that case, there would be a loss to the importer. To avoid such risk, he enters in the three months futures contract to buy \$100 at Rs. 45/\$. This would have the effect of fixing the price to be paid to the US exporter at Rs. 4500 regardless of the dollar-price quote after three months that may appreciate or depreciate.

Basically futures contracts are used to eliminate risk when the future course of action regarding the receipt or payment is certain while the option contract are used when the future course of action is uncertain.

2. Speculators

While hedgers are interested in reducing or eliminating the risk, Speculators buy and sell the derivatives to make profit and not to reduce the risk. They buy when they believe futures or options to be under priced and sell when they view them as overpriced. John Stuart Hill (1871) elaborated by observing that speculators play an important role in stabilizing prices. Because they buy when prices are low and sell when prices are high, in turn improve the temporal allocation of resources and have a dampening effect on seasonal price fluctuations. Speculators willingly take increased risks. Speculators wish to take a position in the market by betting on the future price movements of an asset. Futures and options contracts can increase both the potential gains and losses in a speculative venture. Speculators are important to derivatives market as they facilitate hedging, provide liquidity, ensure accurate pricing and help to maintain price stability. It is the speculators who keep the market going because they bear the risk, which no one else is willing to bear. It is unlikely in any market that hedgers wishing to buy, for example, will precisely match hedgers selling futures in terms of number of contracts. It is only the speculators who take the opposite position with the hedgers and therefore, provide liquidity to the market. A liquid market is one in which there is considerable buying and selling on a continuous basis. In a liquid market, hedgers can make their transactions with ease and with little effect on prices. In the absence of speculators, hedgers may have difficulty in finding counter parties and they may need to move prices in order to attract counter parties.

Speculators also help to make a market informationally efficient. A market is informationally efficient when prices fully reflect all available relevant information. Speculators are likely to consider all relevant information when deciding upon the appropriate price of a future or option contract. If actual prices differed from those judged appropriate, they will be brought into line with the estimated prices by speculative traders, under priced futures will be bought (and so their prices will tend to rise), while overpriced futures will be sold until their prices have fallen to the level considered correct. Therefore, it is rightly said that a well-regulated speculative transactions are the backbone of an efficient and liquid market.

3. Arbitrageurs

An arbitrageur is a person who simultaneously enters into a transaction in two or more markets to take advantage of price discrepancy in those markets. It is totally a riskless activity. For example, if the futures prices of an asset are very high relative to the cash price, an arbitrageur will make profit by buying the asset in spot market and simultaneously selling the futures. Hence, arbitrage involves making profits from relatively mispricing and thereby enhancing the price stability in the market. All three types of traders and investors are required for a healthy functioning of the derivatives market. Hedgers and investors provide economic substance to the market and without them market would become mere tools of gambling. Speculators provide liquidity and depth to the market. Arbitrageurs help in bringing about price uniformity and price discovery. The presence of hedgers, speculators, and arbitrageurs, not only enables the smooth functioning of the derivatives market but also helps in increasing the liquidity of the market.

Basis for Comparison	Hedging	Speculation
Meaning	The act of preventing an investment against unforeseen price changes is known as hedging.	Speculation is a process in which the investor involves in a trading of financial asset of significant risk, in the hope of getting profits.
What is it?	A means to control price risk.	It relies on the risk factor, in expectation of getting returns.
Involves	Protection against price changes.	Incurring risk to make profits from price changes.
Operators are	Risk averse	Risk lovers

Difference between Hedging and Speculation

Difference between Arbitrage and Speculation

• The aim of both arbitrage and speculation is to make some form of profit even though the techniques used are quite different to each other.

- Arbitrage traders take lower levels of risk, and benefit from the natural market inconsistencies by buying at a lower price from one market and selling at a higher price at another market.
- Speculation is done by trading instruments such as stocks, bonds, currency, commodities, and derivatives, and a speculator looks to make a profit through the rising and falling of the prices in these assets.

Difference between Cash Market and Derivative Market

1. Ownership

When you buy shares in the cash market and take delivery, you are the owner of these shares or you are a shareholder, until you sell the shares. You can never be a shareholder when you trade in the derivatives segment of the capital market. This is because you just hold positional stocks, which you have to square-off at the end of the settlement

2. Holding period

When you buy shares in the cash segment, you can hold the shares for life. This is not true in the case of the futures market, where you have to settle the contract within three months at the very maximum. In fact, when you buy shares in the cash segment they can also be trans-generational, that is they can be transferred from one generation to the other.

3. Dividends

When you buy shares in the cash segment, you normally take delivery and are a owner. Hence, you are entitled to dividends that

companies pay. No such luck when you buy any derivatives contract. This is not only true in the case of dividends, but, also other corporate benefits like rights shares, bonus shares etc.

4. Risk

Both, cash and futures markets pose risk, but the risk in the case of futures can be higher, because you have to settle the contract within a specified period and book losses. In the case of shares bought in the cash market, you can hold onto them for an indefinite period and can hence sell when prices are higher.

5. Investment objective differs

You buy a contract in the derivatives market to hedge risk or to speculate. Individuals buying shares in the cash market are investors.

6. Lots vs shares

In the derivatives segment you buy a lot, while in the cash segment you buy shares.

7. Margin money

In the derivatives segment you pay only margin money for example, if you buy 1 lot of Punjab National Bank (4000 shares) you just pay 15 to 20 per cent of the cost of the 4,000 shares and not the entire amount. That is not true in the case of cash segment, where you have to pay the entire amount and not only margin.

Factors contributing to the growth of Derivatives

Factors contributing to the explosive growth of derivatives are price volatility, globalization of the markets, technological developments and advances in the financial theories.

1. Price Volatility

A price is what one pays to acquire or use something of value. The objects having value maybe commodities, local currency or foreign currencies. The concept of price is clear to almost everybody when we discuss commodities. There is a price to be paid for the purchase of food grain, oil, petrol, metal, etc. the price one pays for use of a unit of another persons money is called interest rate. And the price one pays in one's own currency for a unit of another currency is called as an exchange rate.

2. Globalization of the Markets

Earlier, managers had to deal with domestic economic concerns; what happened in other part of the world was mostly irrelevant. Now globalization has increased the size of markets and as greatly enhanced competition. It has benefited consumers who cannot obtain better quality goods at a lower cost. It has also exposed the modern business to significant risks and, in many cases, led to cut profit margins

3. Technological Advances

A significant growth of derivative instruments has been driven by technological breakthrough. Advances in this area include the development of high speed processors, network systems and enhanced method of data entry. Closely related to advances in computer technology are advances in telecommunications. Improvement in communications allow for instantaneous worldwide conferencing, Data transmission by satellite. At the same time there were significant advances in software programmed without which computer and telecommunication advances would be meaningless. These facilitated the more rapid movement of information and consequently its instantaneous impact on market price.

4. Advances in Financial Theories

Advances in financial theories gave birth to derivatives. Initially forward contracts in its traditional form, was the only hedging tool available. Option pricing models developed by Black and Scholes in 1973 were used to determine prices of call and put options. In late 1970's, work of Lewis Edeington extended the early work of Johnson and started the hedging of financial price risks with financial futures. The work of economic theorists gave rise to new products for risk management which led to the growth of derivatives in financial markets.

5. Development of sophisticated risk management tools

In certain derivative trading, a typical type of risk is emerged. To manage this, sophisticated tools have been developed. This "solution to derivative problems" add further growth in derivative market.

Growth and development of derivative market in India

Derivative market in India are comparatively of recent origin. They cater to the investment risk management needs of the financial and product market. Several committees have been set up to review the functioning of financial and derivative markets to ensure that investors risk management needs are fulfilled by products offered by these changes.

At present Indian market trades in both exchange traded and over the counter derivative on various asset classes including securities, commodities, currencies, stock indices etc. today, the derivative markets in india are growing. The growth and development of financial derivative in India may be studied for each asset class as follows:

1. Growth of equity derivative market

India joined the league of exchange traded equity derivative in June 2000, when futures contracts were introduced at two major exchanges, namely, BSE and NSE. The BSE sensitive index, popularly known as the SENSEX, and S&P CNX Nifty index commenced trade n futures on June 9, 2000 and June 12, 2000 respectively. The growth of equity derivatives business on Indian exchanges has been phenomenal. A modest start of an average daily volume of Rs. 10 crores has developed into a business opportunity of Rs. 30,000 crores per day.

2. Growth of commodity derivative markets

The forward contract Regulation Act governs commodity derivative in India. The FCRA specifically prohibits OTC commodity derivatives. Further, FCRA does not even allow options on commodities. It should be noted that the trading in commodity derivatives has been concentrated regionally. This is due to the regional exchanges offered only a single product. For example, pepper exchange in Kochi trades only. Soya exchange in Indore trades only soya.

3. Growth of currency derivative market

India has been trading forward contracts in currency for the last years. Recently, the RBI has allowed options in the OTC market. The OTC currency market in the country is well developed. However, the business is concentrated with a limited number of market participants, mainly, banks-both international and local. The business in currency derivatives is expected to grow in the near future.

4. Growth of interest rate derivative markets

There has been significant progress in interest rate derivatives in

the India OTC market. The NSE introduced trading in cash settled interest rate futures in the year 2003. However, due to some structural issues, the product did not attract market participants. The trading in interest rate derivative in India is now growing.

5. Growth of other derivative markets

Credit derivatives, weather derivatives etc. have been recently introduced in India. They are expected to grow in the coming years.

Factors responsible for the growth of Financial Derivative markets in India

There are a large number of factors that contribute to the growth of financial derivative markets in India. All such factors may be classified into environmental factors and internal factors.

A. Environmental factors

Environmental factors contribute to the growth of financial derivative markets in India. Following are the environmental factors

1. Price volatility

It refers to rapid changes in the prices of assets in the financial markets over a short period of time.

2. Globalisation of markets

Globalization has increased the size of markets. This has exposed the modern businesses to greater risk. Increased size has also led to greater use of debt in capital structures. This has contributed to an increase in financial risks of firms.

3. Technological advances:

Technological advances have also motivated the financial deriva-

tive markets. Technological advances involve computer and internet technologies. These developments encouraged not only the modeling and design of complex financial deals and instruments, but also facilitated trading in them on 24*7 time frame.

4. Regulatory changes

Much of the financial derivative markets activity in recent years in india has been fostered by an atmosphere of deregulation of financial sector. Deregulation has increased the competiton and forced industries to become competitive.

B. Internal factors

The following are internal factors that have contributed to the growth of financial derivativbe markets in India.

1. Liquidity needs:

Business firms have liquidity needs. Many of the financial innovations pioneered in the recent past have targeted these needs.

2. Risk aversion

Most of the investors would like to avoid risks. Derivative instruments are useful for avoiding risk.

3. Risk executives:

Increased risk perceptions of corporate organization promoted to recruit personnel with risk management training. Most big and medium enterprises maintain risk management team.

Stock market derivatives in India

In India, derivatives are traded on organized exchanges as well as on OTC markets. Derivatives in financial securities were introduced in the national stock exchange (NSE) AND THE Bombay stock exchange (BSE) in 2000. Commodity derivatives were introduced in the year 2003 with the establishment of the multi commodity exchange, the national multi commodity exchange and the national commodity and derivatives exchange ltd.

Let us examine the important stock market derivatives in India

1. Index futures:-

The first derivative product traded on the BSE and NSE was index futures. This was introduced in 2000.

a. Index futures at NSE

NSE is now one of the prominent exchanges amongst all emerging markets, in terms of equity derivatives turnover. The index futures trading at NSE commenced on 12/06/2000 on S&P CNX Nifty index.

b. Index futures at BSE

The index futures trading at BSE commenced on 09/06/2000 on BSE sense over a period of time (2000-2012) many indices have been made available for index futures trading.

2. Stock futures or Futures on individual securities

Futures on individual securities introduced in November 2001. These are cash settled. These do not involve deliver of the underlying assets. Today, the most preferred product on the exchanges in single stock futures. This accounts for 55% of total volume.

3. Index options

Index options are financial derivatives based on stock indices such as the S&P 500 or the Dow Jones Industrial Average. Index options give the investor the right to buy or sell the underlying stock index for a defined time period. Since index options are based on a large basket of stocks in the index, investors can easily diversify their portfolios by trading them. Index options are cash settled when exercised, as opposed to options on single stocks where the underlying stock is transferred when exercised.

a. **Index options at NSE**: The index options were allowed for trading on S&p CNX nifty index on june 4 2001. Sonce its inception, index options at NSE has been growing in overall equity derivative market.

b. **Index options at BSE**: BSE commenced trading in index option on Sensex on june 1 2001. BSE launched the chhota (mini) sensex on june 1 2008. With a small or mini market lot of 5, it allows, for comparatively lower capital outlay, lower trading cost, more precise hedging and flexible trading.

4. Stock options or options on individual securities.

Options on individual securities were introduced in July 2001. These are cash settled. These do not involve physical delivering of the underlying asset.

Other derivatives in India

Apart from the futures and options on stock indices and individual stocks, there are some other derivative in India. Such derivatives may be briefly discussed below.

1. Commodity derivatives

The forward contract regulation Act governs commodity derivatives in the country. The FCRA specifically prohibits OTC commod-
ity derivatives, therefore, at present, India trades only exchange traded commodity futures.

2. Interest rate derivatives

The NSE launched short term and long term interest rate futures in June 2003. However, the trading activity in interest rate futures was very thin. The major reason for this low volume of trading in interest rate futures is the existence of well developed OTC market for interest rate swaps and forward rate agreements.

3. Currency derivatives

India has been trading forward contracts in currency, for the last several years. Recently, the reserve bank of India ha also allowed options in the over the counter market. The OTC currency market in the country is considerably large and well developed.

4. Credit derivatives

Since 2003, the RBI has been looking into the introduction of credit derivatives and on may 17, 2007, it allowed banks to enter into single entity credit default swaps. Credit derivatives allow lenders to buy protection against default by borrowers. It is the transfer of the credit risk from one party to another without transferring the underlying.

5. Weather derivatives

SEBI is planning to allow trading in weather derivatives. It is a financial instrument to reduce risk associated with adverse or unexpected weather conditions, eg, in agriculture sector. Weather derivative was pioneered by enron in US in 1997.

MODULE III FORWARDS AND FUTURES

A forward contract is a simple customized contract between two parties to buy or sell an asset at a certain time in the future for a certain price. Unlike future contracts, they are not traded on an exchange, rather traded in the over-the-counter market, usually between two financial institutions or between a financial institution and one of its client. In brief, a forward contract is an agreement between the counter parties to buy or sell a specified quantity of an asset at a specified price, with delivery at a specified time (future) and place. These contracts are not standardized, each one is usually customized to its owner's specifications.

Features of forward contract

The basic features of a forward contract are given in brief here as under:

Bilateral: Forward contracts are bilateral contracts, and hence, they are exposed to counter-party risk.

More risky than futures: There is risk of non-performance of obligation by either of the parties, so these are riskier than futures contracts.

Customised contracts: Each contract is custom designed, and hence, is unique in terms of contract size, expiration date, the asset type, quality, etc.

Long and short positions: In forward contract, one of the par-

ties takes a long position by agreeing to buy the asset at a certain specified future date. The other party assumes a short position by agreeing to sell the same asset at the same date for the same specified price. A party with no obligation offsetting the forward contract is said to have an open position. A party with a closed position is, sometimes, called a hedger.

Delivery price: The specified price in a forward contract is referred to as the delivery price. The forward price for a particular forward contract at a particular time is the delivery price that would apply if the contract were entered into at that time. It is important to differentiate between the forward price and the delivery price. Both are equal at the time the contract is entered into. However, as time passes, the forward price is likely to change whereas the delivery price remains the same.

Synthetic assets: In the forward contract, derivative assets can often be contracted from the combination of underlying assets, such assets are oftenly known as synthetic assets in the forward market. The forward contract has to be settled by delivery of the asset on expiration date. In case the party wishes to reverse the contract, it has to compulsorily go to the same counter party, which may dominate and command the price it wants as being in a monopoly situation.

Pricing of arbitrage based forward prices: In the forward contract, covered parity or cost-of-carry relations are relation between the prices of forward and underlying assets. Such relations further assist in determining the arbitrage-based forward asset prices.

Popular in forex market: Forward contracts are very popular in foreign exchange market as well as interest rate bearing instruments. Most of the large and international banks quote the forward rate through their 'forward desk' lying within their foreign exchange trading room. Forward foreign exchange quotes by these banks are displayed with the spot rates.

Different types of forward: As per the Indian Forward Contract Act-1952, different kinds of forward contracts can be done like hedge contracts, transferable specific delivery (TSD) contracts and non-transferable specific delivery (NTSD) contracts. Hedge contracts are freely transferable and do not specify, any particular lot, consignment or variety for delivery. Transferable specific delivery contracts are though freely transferable from one party to another, but are concerned with a specific and predetermined consignment. Delivery is mandatory. Non-transferable specific delivery contracts, as the name indicates, are not transferable at all, and as such, they are highly specific.

Difference between spot contract and forward contract

The difference between the spot contract and a forward contract is that:

- 1. the spot contract has a fixed price on the currency, and the forward contract has a flexible price.
- 2. the spot contract is a contract to be settled immediately, and the forward contract is a contract to be settled at a future agreed-upon date.
- 3. the spot contract is a derivative, and the forward contract is not a derivative.
- 4. the spot contract has a fixed price but the contract can be settled at a later date, and the forward contract is a contract to be settled immediately.

Difference between Future and Forward contract

Definition	A forward contract is an agreement between two parties to buy or sell an asset (which can be of any kind) at a pre-agreed future point in time at a specified price.	A futures contract is a stan- dardized contract, traded on a futures exchange, to buy or sell a certain under- lying instrument at a cer- tain date in the future, at a specified price.
Structure & Purpose	Customized to customer needs. Usually no initial payment required. Usu- ally used for hedging.	Standardized. Initial mar- gin payment required. Usually used for specula- tion.
Transaction method	Negotiated directly by the buyer and seller	Quoted and traded on the Exchange
Market regulation	Not regulated	Government regulated market (the Commodity Futures Trading Commis- sion or CFTC is the gov- erning body)
Institutional guarantee	The contracting parties	Clearing House
Ri-sk	High counterparty risk	Low counterparty risk
Guaran-te-se	No guarantee of settle- ment until the date of ma- turity only the forward price, based on the spot price of the underlying as- set is paid	Both parties must deposit an initial guarantee (mar- gin). The value of the op- eration is marked to mar- ket rates with daily settle- ment of profits and losses.

Contract Maturtiy	Forward contracts gen- erally mature by deliver- ing the commodity.	Future contracts may not necessarily mature by de- livery of commodity.
Expiry date	Depending on the transaction	Standardized
Method of pre-termination	Opposite contract with same or different counterparty. Counter party risk remains while terminating with different counterparty.	Opposite contract on the exchange.
Contract Size	Depending on the trans- action and the require- ments of the contracting parties.	Standardized
Market	Primary & Secondary	Primary

Limitations of forward contract

The disadvantages of forward contracts are:

- 1) It requires tying up capital. There are no intermediate cash flows before settlement.
- 2) It is subject to default risk.
- 3) Contracts may be difficult to cancel.
- 4) There may be difficult to find a counter-party.

Payoff on Forward Contracts

Forward contracts are privately executed between two parties. The buyer of the underlying commodity or asset is referred to as the long side whereas the seller is the short side. The obligation to buy the asset at the agreed price on the specified future date is referred to as the long position. A long position profits when prices rise. The obligation to sell the asset at the agreed price on the specified future date is referred to as the short position. A short position profits when prices go down. What is the payoff of a forward contract on the delivery date? Let T denote the expiration date, K denote the forward price, and PT denote the spot price (or market price) at the delivery date. Then

- For the long position: the payoff of a forward contract on the delivery date is PT_K
- For the short position: the payoff of a forward contract on the delivery date is K_PT

Figure shows a payoff diagram on a contract forward. Note that both the long and short forward payoff positions break even when the spot price is equal to the forward price. Also note that a long forward's maximum loss is the forward price whereas the maximum gain is unlimited.

For a short forward, the maximum gain is the forward price and the maximum loss is unlimited.



FUTURES

A futures contract is a legal agreement to buy or sell a particular commodity asset, or security at a predetermined price at a specified time in the future. Futures contracts are standardized for quality and quantity to facilitate trading on a futures exchange. The buyer of a futures contract is taking on the obligation to buy and receive the underlying asset when the futures contract expires. The seller of the futures contract is taking on the obligation to provide and deliver the underlying asset at the expiration date.

Features of Futures

1. Organised Exchanges:

Unlike forward contracts which are traded in an over-the-counter market, futures are traded on organised exchanges with a designated physical location where trading takes place. This provides a ready, liquid market in which futures can be bought and sold at any time like in a stock market.

2. Standardisation:

In the case of forward currency contracts, the amount of commodity to be delivered and the maturity date are negotiated between the buyer and seller and can be tailormade to buyer's requirements. In a futures contract, both these are standardised by the exchange on which the contract is traded.

3. Clearing House:

The exchange acts as a clearing house to all contracts struck on

the trading floor. For instance, a contract is struck between A and B. Upon entering into the records of the exchange, this is immediately replaced by two contracts, one between A and the clearing house and another between B and the clearing house.

4. Margins:

Like all exchanges, only members are allowed to trade in futures contracts on the exchange. Others can use the services of the members as brokers to use this instrument. Thus, an exchange member can trade on his own account as well as on behalf of a client. A subset of the members is the "clearing members" or members of the clearing house and non- clearing members must clear all their transactions through a clearing member.

5. Marking to Market:

The exchange uses a system called marking to market where, at the end of each trading session, all outstanding contracts are reprised at the settlement price of that trading session. This would mean that some participants would make a loss while others would stand to gain. The exchange adjusts this by debiting the margin accounts of those members who made a loss and crediting the accounts of those members who have gained.

6. Actual Delivery is Rare:

In most forward contracts, the commodity is actually delivered by the seller and is accepted by the buyer. Forward contracts are entered into for acquiring or disposing off a commodity in the future for a gain at a price known today.

Advantages of futures

1. Opens the Markets to Investors

Futures contracts are useful for risk-tolerant investors. Investors get to participate in markets they would otherwise not have access to.

2. Stable Margin Requirements

Margin requirements for most of the commodities and currencies are wellestablished in the futures market. Thus, a trader knows how much margin he should put up in a contract.

3. No Time Decay Involved

In options, the value of assets declines over time and severely reduces the profitability for the trader. This is known as time decay. A futures trader does not have to worry about time decay.

4. High Liquidity

Most of the futures markets offer high liquidity, especially in case of currencies, indexes, and commonly traded commodities. This allows traders to enter and exit the market when they wish to.

5. Simple Pricing

Unlike the extremely difficult Black-Scholes Model-based options pricing, futures pricing is quite easy to understand. It's usually based on the cost-of-carry model, under which the futures price is determined by adding the cost of carrying to the spot price of the asset.

6. Protection Against Price Fluctuations

Forward contracts are used as a hedging tool in industries with high level of price fluctuations. For example, farmers use these contracts to protect themselves against the risk of drop in crop prices.

7. Hedging Against Future Risks

Many people enter into forward contracts for better risk management. Companies often use these contracts to limit risk that may arise from foreign currency exchange.

The Disadvantages of Futures Contracts

1. No Control Over Future Events

One common drawback of investing in futures trading is that you don't have any control over future events. Natural disasters, unexpected weather conditions, political issues, etc. can completely disrupt the estimated demand-supply equilibrium.

2. Leverage Issues

High leverage can result in rapid fluctuations of futures prices. The prices can go up and down daily or even within minutes.

3. Expiration Dates

Future contracts involve a certain expiration date. The contracted prices for the given assets can become less attractive as the expiration date comes nearer. Due to this, sometimes, a futures contract may even expire as a worthless investment.

Futures Terminology

- Commodity Futures Market a physical or electronic marketplace where traders buy and sell commodity futures contracts.
- 2. Commodity Futures Contracts purchase and sales agree-

ments having standardized terms, including quantities, grades, delivery periods, price basis, and delivery methods of a particular commodity.

- 3. Long Position a buyer of futures contracts. A long position is the number of purchase contracts held by the buyer.
- 4. Short Position a seller of futures contracts. A short position is the number of sales contracts held by the seller.
- Trade Volume the number of transactions executed for a particular time period. The purchase by the buyer and sale by the seller of one futures contract equals a volume of ONE (Purchases and sales are not double counted.)
- Open interest the number of futures contracts that exist on the book of the Clearinghouse. One purchase and sale, involving two transacting parties – constitutes an open interest of ONE. The number of purchase and sale contracts is always equal.
- 7. Closing Price the fair value price trading near the end of the trading session, as determined by the exchange.
- 8. Futures Delivery the transfer of commodity ownership from the short (the seller) to the long (the buyer) during the delivery period. Ownership is transferred by the surrender of warehouse receipts or some other negotiable instrument specified by the contract.
- 9. Futures Expiration- the last trading day of futures contract.
- 10. Volatility the variability of prices over time (historical) or projected (Implied) as determined by a formula.

- 11. Historical and Implied Volatility Historical Volatility is a measure of price variability showing the variation or "dispersion" of prices from the mean over a chosen time period. Is calculated using a standard deviation Quantity:50 MT EU origin wheatGrade: Sound, Fair, Merchantable Quality Deliverable months: Jan, March, May, August, November Price basis Euros per tonn minimum price movement25 euro cents (•12.50 per contract)Delivery method: Warehouse receipts in store silo Rouen 2 formula. Implied Volatility is based on a option pricing model (such as Black Scholes) using premiums paid for at-the-money options on futures, that is - the option with a strike price closest to the futures price. For example, if maize is trading at \$6.03/bushel, than IV is derived from the premiums paid for \$6.00 strike. Historical Volatility is backward looking whereas Implied Volatility often called the fear index - is forward looking.
- 12. Clearinghouse the entity of a futures exchange that acts as counterparty to every transaction. The clearinghouse "clears" every transaction by becoming the buyer to the seller and the seller to the buyer. The clearinghouse always holds an equal number of buy and sell contracts. The purpose of the clear-inghouse is to guard against default.
- 13. Default the failure of a long or short to deposit sufficient margin with the clearinghouse. Also – the failure of a seller to make delivery or the failure of a buyer to take delivery of the commodity during the delivery period.
- 14. Position Limit the maximum number of buy or sell contracts that a speculator can hold at one time in a futures conract.

Normally, exchanges require position limits to be reduced as the delivery period approaches.

15. Hedging – buying or selling futures contracts against opposite cash positions. Producers that sell futures against anticipated harvest are called short hedgers. End-users, such as wheat millers that buy futures against anticipated inventory needs, are called long hedgers.

Types of futures

There are many types of futures contracts available for trading including:

- Commodity futures such as in crude oil, natural gas, corn, and wheat
- Stock index futures such as the S&P 500 Index
- Currency futures including those for the euro and the British pound
- Precious metal futures for gold and silver
- U.S. Treasury futures for bonds and other products

Trading process

The trading process of futures involves the following steps

- 1. Select brokerage
- 2. Opening a trading account
- 3. Choose a commodity or financial instrument to trade
- 4. Study different contract, the costs and goods

- 5. Develop a trading strategy
- 6. Purchase the futures contract

Future trading mechanism

- 1. Placing an order
- 2. Role of the clearing house
- 3. Daily settlement
- 4. Settlement

Role of clearing house

A clearing house acts as an intermediary between a buyer and seller and seeks to ensure that the process from trade inception to settlement is smooth. Its main role is to make certain that the buyer and seller honor their contract obligations.

Responsibilities include settling trading accounts, clearing trades, collecting and maintaining margin monies, regulating delivery of the bought/sold instrument, and reporting trading data. Clearing houses act as third parties to all futures and options contracts, as buyers to every clearing member seller, and as sellers to every clearing member buyer. The clearing house enters the picture after a buyer and seller have executed a trade. Its role is to consolidate the steps that lead to settlement of the transaction. In acting as the middleman, a clearing house provides the security and efficiency that is integral for financial market stability.

Clearing houses take the opposite position of each side of a trade which greatly reduces the cost and risk of settling multiple transactions among multiple parties. While their mandate is to reduce risk, the fact that they have to be both buyer and seller at trade inception means that they are subject to default risk from both parties. To mitigate this, clearing houses impose margin (initial and maintenance) requirements.

Functions of clearing house

A clearing house is basically the mediator between two transacting parties. However, there is also more to what clearing houses do. Let's take a look at some of their functions in more detail.

- 1. The clearing house guarantees that the transactions will occur smoothly and that both parties will receive what is due to them. This is done by checking the financial capabilities of both parties to enter into a legal transaction, regardless of whether they are an individual or an organization.
- 2. The clearing firm makes sure that the parties involved respect the system and follow the proper procedures for a successful transaction. The facilitation of smooth transactions leads to a more liquid market.
- 3. It is the clearing house firm that provides a level playing field for both parties, where they can agree on the terms of their negotiation. This includes having the responsibility for setting the price, quality, quantity, and maturity of the contract.
- 4. The clearing house makes sure that the right goods are delivered to the buyer, in terms of both quantity and quality, so that at the end of the transaction there are no complaints nor arbitration necessary.

Margin system

In futures contract, the clearing house undertakes the default risk.

To protect itself from this risk, the clearing house requires the participants to keep margin money. Thus margins are amounts required to be paid by dealers in respect of their futures position to ensure that both parties will perform their contract obligations.

Types of margin

1. Initial Margin

Initial Margin is the capital sum which an investor needs to park with his broker as a down payment in its account to initiate trades. This acts as a collateral. An investor can offer cash and securities or other collateral like open ended Mutual fund as collateral to enter into a trade. In most cases, especially for equity securities, the initial margin requirement is 30 % or exchange defined margin whichever is higher, but this may vary. And yes, both buyers and sellers must put up a payment to enter into a trade.

2. Maintenance Margin

After purchasing the stocks, a minimum balance called as maintenance margin needs to be parked with the broker. In case the margin drops below the limit, your broker will make a margin call and can also liquidate the position if you do not make up for the requirement amount. Maintenance Margin varies between 20-30% subject to minimum exchange charged margin and may change depending on a position an investor wants to hold in a stock market.

3. Variation Margin

Variation margin is the additional amount of cash you are required to deposit in your trading account to bring it up to the initial margin after you have incurred sufficient losses to bring it below the "Maintenance Margin". Variation Margin = Initial Margin - Margin Balance.

Marking to Market (daily settlement)

Marking to market refers to the daily settling of gains and losses due to changes in the market value of the security. For financial derivative instruments, such as futures contracts, use marking to market.

If the value of the security goes up on a given trading day, the trader who bought the security (the long position) collects money – equal to the security's change in value – from the trader who sold the security (the short position). Conversely, if the value of the security goes down on a given trading day, the trader who sold the security collects money from the trader who bought the security. The money is equal to the security's change in value.

The value of the security at maturity does not change as a result of these daily price fluctuations. However, the parties involved in the contract pay losses and collect gains at the end of each trading day.

Arrange futures contracts using borrowed money via a clearinghouse. At the end of each trading day, the clearinghouse settles the difference in the value of the contract. They do this by adjusting the margin posted by the trading counterparties. The margin is also the collateral.

Stock Futures

Stock Futures are financial contracts where the underlying asset is an individual stock. Stock Future contract is an agreement to buy or sell a specified quantity of underlying equity share for a future date at a price agreed upon between the buyer and seller. The contracts have standardized specifications like market lot, expiry day, unit of price quotation, tick size and method of settlement.

Currency futures

Currency futures are a exchange-traded futures contract that specify the price in one currency at which another currency can be bought or sold at a future date. Currency futures contracts are legally binding and counterparties that are still holding the contracts on the expiration date must deliver the currency amount at the specified price on the specified delivery date. Currency futures can be used to hedge other trades or currency risks, or to speculate on price movements in currencies.

Features of Currency futures

The Features of currency futures are:

- > High Liquidity
- > Simple and easy to understand
- > Standardized trading platform with Online/Offline modes
- > Less volatile market as compared to other trading products
- > Low Margin with High Leverage
- Currency follows close correlations with Equities, Commodities
- > Currency Options are also available in USD/INR
- > Spread Trading Inter Currency and Intra Currency Spread
- Huge trading limits for Retail, corporate and Institutional clients
- Exchange Traded Currency Derivatives are effective risk management tools

Interest rate futures

Interest rate futures are a type of futures contract that are based on a financial instrument which pays interest. It is a contract between a buyer and a seller which agrees to buy and sell a debt instrument at a future date when the contract expires at a price that is determined today.

Some of these futures may require the delivery of specific types of bonds, mostly government bonds on the delivery date.

These futures may also be cash-settled in which case, the one who holds the long position receives and one who holds the short position pays. These futures are thus used to hedge against or offset interest rate risks. Which means investors and financial institutions cover their risks against future interest rate fluctuations with these.

These futures can be short or long term in nature. Short term futures invest in underlying securities that mature within a year. Long term futures have a maturity period of more than one year.

Pricing for these futures is derived by a simple formula: 100 - the implied interest rate. So a futures price of 96 means that the implied interest rate for the security is 4 percent.

Since these futures trade in government securities, the default risk is nil. The prices depend only on the interest rates.

Applications of interest rate futures

1. Long hedge

T bills futures are used to hedge the short term interest rate risk. A long hedge involves buying futures contract, in other words, long hedge means assuming a long position in the futures market. 2. Short hedge

A short hedge involves selling futures contract. If interest rates in the economy go up, issuer will pay the investors m0re but will be compensated by taking short position in the futures contract.

3. Converting floating rate loan to a fixed rate loan

A fixed rate loan carries a constant interest rate over the life of the loan. A floating interest a rate involves the rate being changed at regular pre defined intervals during the loan period.

4. Converting a fixed rate loan to floating rate loan

We can convert a fixed rate loan to a floating rate loan by using an interest rate future to protect from risk of unfavorable changes in the interest rate.

5. Extending the maturity of the security

Interest rate futures can e used to extend the maturity of a debt market security.

6. Shortening the maturity of the security

We can use futures for reducing the maturity of a debt market security.

7. Hedging a commercial paper issue

When short term interest rates are expected to increase, the issuer can hedge the futures commercial paper issue by taking short position in T bill futures contracts.

8. Hedging a bond port folio with T bond futures

Fixed income portfolio managers often use T bond futures to shield the futures values of their portfolios against interest rate changes.

Stock index futures

Stock index futures, also referred to as equity index futures or just index futures, are futures contracts based on a stock index. Futures contracts are an agreement to buy or sell the value of the underlying asset at a specific price on a specific date. In this case, the underlying asset is tied to a stock index. Index futures, however, are not delivered at the expiration date. They are settled in cash on a daily basis, which means that investors and traders pay or collect the difference in value daily. Index futures can be used for a few reasons, often by traders speculating on how the index or market will move, or by investors looking to hedge their position against potential future losses.

Uses of Stock index futures

1. Speculation

To make money, speculators use index futures by taking long or short position. Such positions are taken on the assumption that the index would go up or down, if a person belives that the market would go up in the futures, he may buy futures.

2. Funds lending by Arbitrageur

For an arbitrageur willing to employ funds, the methodology involves first buying shares in the cash market and selling index futures. The quantity of shares to be ought is decided on the basis of their weightage in the index and the order is put through the system simultaneously using the programe trading methods. At the same time a sell position is taken in the futures market.

3. Securities lending

An arbitrageur can earn returns by lending securities in the mar-

ket. The methodology involoved is first selling shares in cash market and buying index futures using the cash received in some risk free investment, and finally buying the same shares and setting the futures position at the expiration.

4. Strategic arbitrage

An arbitrageur need not hold his position till the date of maturity. The basis does not remain uniform. It keeps on changing. This is due to the volatility in the market. The arbitrageur may keep track of the basis and unwind his position as soon as appropriate opportunity is seen and take advantage of changes in the basis is short intervals.

5. Hedging

Stock index futures can be effectively used for hedging purposes. They can be used while taking a long or short position on a stock and for portfolio hedging against unfavorable price movements.

Commodity futures

A commodity futures contract is an agreement to buy or sell a predetermined amount of a commodity at a specific price on a specific date in the future. Commodity futures can be used to hedge or protect an investment position or to bet on the directional move of the underlying asset. Many investors confuse futures contracts with options contracts. With futures contracts, the holder has an obligation to act. Unless the holder unwinds the futures contract before expiration, they must either buy or sell the underlying asset at the stated price.

Features of commodity futures

1. Organized: Commodity futures contracts always trade on an organized exchange. NCDEX and MCX are examples of exchanges

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in India. NYMEX, LME, and COMEX are some international exchanges.

2. **Standardized:** Commodity futures contracts are highly standardized. This means the quality, quantity, and delivery date of commodities is predetermined by the exchange on which they are traded.

3. Eliminate counter-party risk: Commodity futures exchanges use clearinghouses to guarantee fulfillment of the terms of the futures contract. This eliminates the risk of default by the other party.

4. Facilitate margin trading: Commodity futures traders do not have to pay the entire value of a contract. They need to deposit a margin that is 5–10% of the contract value. This allows the investor to take larger positions while investing less capital..

5. Fair practices: Government agencies regulate futures markets closely. For example, there is the Forward Markets Commission (FMC) in India and the Commodity Futures Trading Commission (CFTC) in the Unites States. The regulation ensures fair practices in these markets.

6. Physical delivery: The actual delivery of the commodity can take place on expiry of the contract. For physical delivery, the member needs to provide the exchange with prior delivery information. He also needs to complete all delivery-related formalities as specified by the exchange.

Benefits of Commodity Futures

1. Price Discovery:

Based on inputs regarding specific market information, buyers and sellers conduct trading at futures exchanges. This results into con-

tinuous price discovery mechanism.

2. Hedging:

It is strategy of managing price risk that is inherent in spot market by taking an equal but opposite position in the futures market to protect their business from adverse price change.

3. Import- Export competitiveness:

The exporters can hedge their price risk and improve their competitiveness by making use of futures market. A majority of traders which are involved in physical trade internationally intend to buy forwards. The existence of futures market allows the exporters to hedge their proposed purchase by temporarily substituting for actual purchase till the time is ripe to buy in physical market.

4. Portfolio Diversification

Commodity offers at another investment options which is largely negatively correlated with equity and currency and thus could offer great portfolio diversification.

Futures pay-offs or profit or loss

Futures contracts have linear payoffs. In simple words, it means that the losses as well as profits for the buyer and the seller of futures contracts are unlimited. These liner payoffs are fascinating as they can be combined with options and the underlying to generate various complex payoffs.

Payoff for Buyer of Futures:

Long Futures the payoff for a person who buys a futures contract is similar to the payoff for a person who holds an asset .He has a potentially unlimited upside as well as a potentially unlimited downside. Take the case of a speculator who buys a two month nifty index futures contract when the nifty stands at 2220. The underlying asset in this case is the nifty portfolio. When the index moves down it starts making losses.

Fig 5.3 shows the payoff diagram for the buyer of a futures contract



The payoff diagram for the buyer of a futures contract

The Fig. shows the profits/losses for a long futures position. The investor bought futures when the index was at 2220. If the index goes up, his futures position starts making profit. If the index falls, his futures position starts showing losses.

Payoff for Seller of Futures:

Short Futures The payoff for a person who sells a futures contract is similar to the payoff for a person who shorts an asset. He/she has a potentially unlimited upside as well as a potentially unlimited downside. Take the case of a speculator who sells two-month Nifty index futures when the Nifty stands at 2220. The underlying asset in this case is the Nifty portfolio. When the index moves up, it starts making losses.

Figure 5.4 shows the payoff diagram for the seller of a futures contract.



Fig. The payoff diagram for the seller of a futures contract

The Fig. shows the profit/losses for a short futures position. The investor sold futures when the index was at 2220. If the index goes down, his futures position starts making profit. If the index rises, his futures position starts showing losses.

Trading strategies in stock futures

Below are four popular futures trading strategies, from the basic to the more complex.

1. Going long

Going long — buying a futures contract — is the most basic futures trading strategy. An investor buys a futures contract expecting the contract to rise in price by expiration.

Best to use when: Buying a futures contract is the most straightforward futures trading strategy for speculating on an asset rising before the contract expires. The futures contract offers a leveraged return on the underlying asset's rise, so the trader expects a clear move higher in the near future.

Risks and rewards: Going long offers the inherent promise of the futures contract: a leveraged return on the underlying asset's rise. It has uncapped upside as long as the asset rises, making this futures trading strategy a potential home run. In this example, if the contract increases 10 cents to \$3.60 (a gain of 2.8%), then your equity stake balloons from \$4,000 to \$6,500 for a return of nearly 63%. That is, the five contracts are now worth \$90,000, and the additional \$2,500 is your gain.

2. Going short

Going short — selling a futures contract — is the flip side of going long. An investorsells a futures contract expecting the contract to fall by expiration.

Best to use when: Selling a futures contract is another straightforward futures trading strategy, but it can be riskier than going long because of the potential for uncapped losses if the underlying asset continues to rise. Investors going short a contract want the full leveraged returns of an asset that is expected to fall.

Risks and rewards: Going short offers many of the same ben-

efits that going long does, most notably the leveraged return on the underlying asset's decline. However, unlike the long position, going short has uncapped downside.

3. Bull calendar spread

A calendar spread is a strategy that has the trader buying and selling contracts on the same underlying asset but with different expirations. In a bull calendar spread, the trader goes long the short-term contract and goes short the long-term contract. A calendar spread reduces the risk in a position by eliminating the key driver of the contract's value — the underlying asset. The goal of this futures trading strategy is to see the spread widen in favor of the long contract.

With a bull calendar spread, traders have multiple ways to win since the spread can widen in a few ways: The long contract can go up, the short contract can go down, the long can go up while the short goes down, the long can go up more than the short goes up, and the long can go down less than the short goes down. The important point is that the spread widens.

Best to use when: The trader must expect the long contract to move up relatively more than the short contract, widening the value of the spread and creating a profit for the trader. A bull calendar spread is a more conservative position that is less volatile than going long. It also requires less margin to set up than a one-leg futures position, and this is a significant advantage of the trade. Plus, this lower margin allows the trader to achieve a higher return on capital.

4. Bear calendar spread

Like the bull calendar spread, the bear calendar spread has the trader buying and selling contracts on the same underlying asset but

with different expirations. A calendar spread reduces the risk by neutralizing the key driver of the contract's value — the underlying asset. In a bear calendar spread, the trader sells the short-term contract and buys the long-term contract. The goal of this futures trading strategy is to see the spread widen in favor of the short contract.

With a bear calendar spread, traders have multiple ways to win since the spread can widen in a few ways: The long contract goes down, the short contract goes up, the long goes down while the short goes up, the long goes down more than the short goes down, and the long goes up less than the short goes up. The important point is that the short September contract becomes more expensive relative to the long December contract.

Best to use when: The trader must expect the short contract to increase relatively more than the long contract, widening the value of the spread and creating a profit. A bear calendar spread is a more conservative position that is less volatile, requiring less margin to set up than a one-leg futures position, and this is a significant advantage of the spread trade. This lower margin requirement allows the trader to achieve a higher return on capital.

Risks and rewards: The appeal of the bear calendar spread is that you can generate nice returns on a conservative strategy while the broker requires lower margin. This reduced margin helps boost your percentage return on a successful trade.

Settlement of futures

When a futures trader takes a position (long or short) in a futures contract, he can settle the contract in three different ways.

1. Closeout: In this method, the futures trader closes out the

futures contract even before the expiry. If he is long a futures contract, he can take a short position in the same contract. The long and the short position will be off-set and his margin account will be marked to marked and adjusted for P&L. Similarly, if he is short a futures contract, he will take a long position in the same contract to close out the position.

2. Physical Delivery: If the futures trader does not closeout the position before expiry, and keeps the position open and allows it to expire, then the futures contract will be settled by physical delivery or cash settlement (discussed below). This will depend on the contract specifications. In case of the physical delivery, the clearinghouse will select a counterparty for physical settlement (accept delivery) of the futures contract.

Typically the counterpart selected will be the one with the oldest long position. So, at the expiry of the futures contract, the short position holder will deliver the underlying asset to the long position holder.

3. Cash Settlement: In case of cash settlement (in case the contract has expired), there is no need for physical delivery of the contract. Instead the contract can be cashsettled. This can be done only if the contract specifies so. If a contract can be cash settled, the trader need not closeout the position before expiry, He can just leave the position open. When the contract expires, his margin account will be marked-to market for P&L on the final day of the contract. Cash settlement is a preferred option for most traders because of the savings in transaction costs.

MODULE IV OPTIONS

Introduction

Portfolio investments normally include mutual funds stocks and bonds. The type of securities not end here, as 30ptions 3present a world of opportunity to sophisticated investors, as another type of security with their veracity. Options can be as speculative or as conservative as one wants. They are complex securities and can be extremely risky. But at the same time ignorant of this type of investment places one in a weak position. Without knowledge about options, one would not only forfeit having another item in ones investing toolbox but also lose insight into the workings of some of the world's largest corporations. Whether it is to hedge his risk of foreign-exchange transactions or to give employees ownership in the form of stock options, most multinationals today use options in some form or another.2.2 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 honor 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 won'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 notan obligation to do something. You can always 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 its 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.

Participants in the Options Market

There are four types of participants in options markets depending on the position they take: They are:

- 1. Buyers of calls
- 2. Sellers of calls
- 3. Buyers of puts
- 4. Sellers of puts

People who buy options are called holders and those who sell options are called writers: furthermore, buyers are said to have long positions, and sellers are said to have short positions. -Call holders and put holders (buyers) are not obligated to buy or sell. They have the choice to exercise their rights if they choose. -Call writers and put writers (sellers), however, are obligated to buy or sell. This means that a seller may be required to make good on promise to buy or sell.

There are many different types of options that can be traded and these can be categorized in a number of ways. In a very broad sense, there are two main types: calls and puts. Calls give the buyer the right to buy the underlying asset, while puts give the buyer the right to sell the underlying asset. Along with this clear distinction, options are also usually classified based on whether they are American style or European style.

This has nothing to do with geographical location, but rather when the contracts can be exercised. You can read more about the differences below.

Classification of options

Options can be further categorized based on the method in which

they are traded, their expiration cycle, and the underlying security they relate to. There are also other specific types and a number of exotic options that exist. On this page we have published a comprehensive list of the most common categories along with the different types that fall into these categories. We have also provided further information on each type.

- Calls
 Option Type by Expiration
- Puts

- Option Type by Underlying Security
- American Style
- European Style
- Employee Stock Options
- Cash Settled Options
- Exchange Traded Options Exotic Options
- Over The Counter Options

Calls

Call options are contracts that give the owner the right to buy the underlying asset in the future at an agreed price. You would buy a call if you believed that the underlying asset was likely to increase in price over a given period of time. Calls have an expiration date and, depending on the terms of the contract, the underlying asset can be bought any time prior to the expiration date or on the expiration date.

Puts

Put options are essentially the opposite of calls. The owner of a put has the right to sell the underlying asset in the future at a predetermined price. Therefore, you would buy a put if you were expecting the underlying asset to fall in value. As with calls, there is an expiration date in the contact.

American Style

The term "American style" in relation to options has nothing to do with where contracts are bought or sold, but rather to the terms of the contracts. Options contracts come with an expiration date, at which point the owner has the right to buy the underlying security (if a call) or sell it (if a put). With American style options, the owner of the contract also has the right to exercise at any time prior to the expiration date.

European Style

The owners of European style options contracts are not afforded the same flexibility as with American style contracts. If you own a European style contract then you have the right to buy or sell the underlying asset on which the contract is based only on the expiration date and not before.

Exchange Traded Options

Also known as listed options, this is the most common form of options. The term "Exchanged Traded" is used to describe any options contract that is listed on a public trading exchange. They can be bought and sold by anyone by using the services of a suitable broker.

Over The Counter Options

"Over The Counter" (OTC) options are only traded in the OTC markets, making them less accessible to the general public. They tend to be customized contracts with more complicated terms than most Exchange Traded contracts.
Option Type by Underlying Security

When people use the term options they are generally referring to stock options, where the underlying asset is shares in a publically listed company. While these are certainly very common, there are also a number of other types where the underlying security is something else. We have listed the most common of these below with a brief description.

Stock Options: The underlying asset for these contracts is shares in a specific publically listed company.

Index Options: These are very similar to stock options, but rather than the underlying security being stocks in a specific company it is an index – such as the S&P 500.

Forex/Currency Options: Contracts of this type grant the owner the right to buy or sell a specific currency at an agreed exchange rate.

Futures Options: The underlying security for this type is a specified futures contract. A futures option essentially gives the owner the right to enter into that specified futures contract.

Commodity Options: The underlying asset for a contract of this type can be either a physical commodity or a commodity futures contract.

Basket Options: A basket contract is based on the underlying asset of a group of securities which could be made up stocks, currencies, commodities or other financial instruments

Option Type By Expiration

Contracts can be classified by their expiration cycle, which relates to the point to which the owner must exercise their right to buy or sell the relevant asset under the terms of the contract. Some contracts are only available with one specific type of expiration cycle, while with some contracts you are able to choose. For most options traders, this information is far from essential, but it can help to recognize the terms.

Below are some details on the different contract types based on their expiration cycle. Regular Options: These are based on the standardized expiration cycles that options contracts are listed under. When purchasing a contract of this type, you will have the choice of at least four different expiration months to choose from. The reasons for these expiration cycles existing in the way they do is due to restrictions put in place when options were first introduced about when they could be traded. Expiration cycles can get somewhat complicated, but all you really need to understand is that you will be able to choose your preferred expiration date from a selection of at least four different months.

Weekly Options: Also known as weeklies, these were introduced in 2005. They are currently only available on a limited number of underlying securities, including some of the major indices, but their popularity is increasing. The basic principle of weeklies is the same as regular options, but they just have a much shorter expiration period.

Quarterly Options: Also referred to as quarterlies, these are listed on the exchanges with expirations for the nearest four quarters plus the final quarter of the following year. Unlike regular contracts which expire on the third Friday of the expiration month, quarterlies expire on the last day of the expiration month.

Long-Term Expiration Anticipation Securities: These longer term contracts are generally known as LEAPS and are available on a fairly wide range of underlying securities.

Employee Stock Options

These are a form of stock option where employees are granted contracts based on the stock of the company they work for. They are generally used as a form of remuneration, bonus, or incentive to join a company.

Cash Settled Options

Cash settled contracts do not involve the physical transfer of the underlying asset when they are exercised or settled. Instead, whichever party to the contract has made a profit is paid in cash by the other party. These types of contracts are typically used when the underlying asset is difficult or expensive to transfer to the other party.

Exotic Options

Exotic option is a term that is used to apply to a contract that has been customized with more complex provisions. They are also classified as Non-Standardized options. There are a plethora of different exotic contracts, many of which are only available from OTC markets. Some exotic contracts, however, are becoming more popular with mainstream investors and getting listed on the public exchanges. Below are some of the more common types.

Barrier Options: These contracts provide a pay-out to the holder if the underlying security does (or does not, depending on the terms of the contract) reach a pre-determined price.

Binary Options: When a contract of this type expires in profit for the owner, they are awarded a fixed amount of money.

Chooser Options: These were named "Chooser," options because they allow the owner of the contract to choose whether it's a call or a put when a specific date is reached.

Compound Options: These are options where the underlying security is another options contract.

Look Back Options: This type of contract has no strike price, but instead allows the owner to exercise at the best price the underlying security reached during the term of the contract

Moneyness of the Options

Moneyness refers to the potential profit or loss from the exercise of an option. At any time before the expiration, an option may be inthe-money, at-the-money, out-of the money.

1. In-the-money options:

An in-the-money (ITM) option is an option that would lead to a positive cashflow to the holder if it were exercised immediately. A call option on the index is said to be inthe- money when the current index stands at a level higher than the strike price (i.e. spot price> strike price). If the index is much higher than the strike price, the call is said to be deep ITM. In the case of a put, the put is ITM if the index is below the strike price.

2. At-the-money option:

An at-the-money (ATM) option is an option that would lead to zero cashflow if it were exercised immediately. An option on the index is at-the-money when the current index equals the strike price (i.e. spot price = strike price).

3. Out-of-the-money option:

An out-of-the-money (OTM) option is an option that would lead to a negative cashflow if it were exercised immediately. A call option

on the index is out-of-the-money when the current index stands at a level which is less than the strike price (i.e. spot price < strike price). If the index is much lower than the strike price, the call is said to be deep OTM. In the case of a put, the put is OTM if the index is above the strike price.

Intrinsic value and time value

To buy an option, an investor must pay an option premium. The option premium can be thought as the sum of two different numbers that represent the value of the option. The first is the current value of the option, known as the intrinsic value. The second is the potential increase in value that the option could gain over time, known as the time value.

Intrinsic Value of an Option

The intrinsic value of an option represents the current value of the option, or in other words how much in the money it is. When an option is in the money, this means that it has a positive payoff for the buyer. A \$30 call option on a \$40 stock would be \$10 in the money. If the buyer exercised the option at that point in time, he would be able to buy the stock at \$30 from the option and then subsequently sell the stock for \$40 on the market, capturing a \$10 payoff. So the intrinsic value represents what the buyer would receive if he decided to exercise the option right now. For in the money options, intrinsic value is calculated as the difference of the current price of the underlying asset and the strike price of the option.

For options that are out of the money or at the money, the intrinsic value is always zero. This is because a buyer would never exercise an option that would result in a loss. Instead, he would let the option expire and get no payoff. Since he receives no payoff, the intrinsic value of the option is nothing to him.

Time Value of an Option

The time value of an option is an additional amount an investor is willing to pay over the current intrinsic value. Investors are willing to pay this because an option could increase in value before its expiration date. This means that if an option is months away from its expiration date, we can expect a higher time value on it because there is more opportunity for the option to increase or decrease in value over the next few months. If an option is expiring today, we can expect its time value to be very little or nothing because there is little or no opportunity for the option to increase or decrease in value.

Time value is calculated by taking the difference between the option's premium and the intrinsic value, and this means that an option's premium is the sum of the intrinsic value and time value:

- Time Value = Option Premium Intrinsic Value
- Option Premium = Intrinsic Value + Time Value

Difference between futures and options

Basis for Comparison Futures Options

Meaning	Futures contract is a binding agreement, for buying and selling of a financial instrument at a predetermined price at a future specified	Options are the contract in which the investor gets the right to buy or sell the financial instrument at a set price, on or before a certain date, however the investor is
	date.	not obligated to do so.

Obligation of buyer	Yes, to execute the contract.	No, there is no obligation.
Execution of contract	On the agreed date.	Anytime before the expiry of the agreed date.
Risk	High	Limited
Advance payment	No advance payment	Paid in the form of premiums
Degree of profit/loss	Unlimited	Unlimited profit and limited loss.

Difference between Forwards and Options

Forwards	Options
1. Both buyer and seller have obligations	1. Only the seller has an obligation
2. Customized contract	2. Standardized contract
3. Not traded in stock exchange	3. Trade in stock exchanges
4. There is no premium and margin	4. The buyer pays premium to the seller, while the seller deposits
5. Expiry date depends upon the transactions	margin initially with subsequent deposits made depending on the market

Positions in the option contract

There are four types of option positions. They are briefly explained as below.

1. Long position in a call option

A person who buys a call option is said to have a long position in

a call option. He purchases the right, but not the obligation to buy underlying asset at the stated exer cise price at any time before the option expires. In short, long means buy.

2. Long position in a put option

A person who buys put option is said to have a long position in a put option. He buys the right, but not the obligation, to sell the underlying asset at the stated exercise price at any time before the option expires.

3. Short position in a call option

A person who sells a call option is said to have a short position in a call option. He sells the right to buy the asset.

4. Short position in a put option

A person who sells a put option is said to have a short position in a put option. He sells the right to sell the asset at a fixed price. He has the obligation to buy the underlying asset at the stated exercise price.

Pay-off for options

The optionality characteristic of options results in a non-linear payoff for options. In simple words, it means that the losses for the buyer of an option are limited, however the profits are potentially unlimited. The writer of an option gets paid the premium. The payoff from the option writer is exactly opposite to that of the option buyer. His profits are limited to the option premium, however his losses are potentially unlimited. These non-linear payoffs are fascinating as they lend themselves to be used for generating various complex payoffs using combinations of options and the underlying asset. We look here at the four basic payoffs.

1. Payoff for buyer of call options:

Long call A call option gives the buyer the right to buy the underlying asset at the strike price specified in the option. The profit/loss that the buyer makes on the option depends on the spot price of the underlying. If upon expiration, the spot price exceeds the strike price, he makes a profit. Higher the spot price, more is the profit he makes. If the spot price of the underlying is less than the strike price, he lets his option expire un-exercised. His loss in this case is the premium he paid for buying the option. Figure 6.1 gives the payoff for the buyer of a three month call option on gold (often referred to as long call) with a strike of Rs. 7000 per 10 gms, bought at a premium of Rs. 500.



The figure shows the profits/losses for the buyer of a three-month call option on gold at a strike of Rs. 7000 per 10 gms. As can be seen, as the prices of gold rise in the spot market, the call option becomes in-the-money. If upon expiration, gold trades above the strike

of Rs. 7000, the buyer would exercise his option and profit to the extent of the difference between the spot gold-close and the strike price. The profits possible on this option are potentially unlimited. However if the price of gold falls below the strike of Rs. 7000, he lets the option expire. His losses are limited to the extent of the premium he paid for buying the option.



3. Payoff for buyer of put options:

Long put A put option gives the buyer the right to sell the underlying asset at the strike price specified in the option. The profit/loss that the buyer makes on the option depends on the spot price of the underlying. If upon expiration, the spot price is below the strike price, he makes a profit. Lower the spot price, more is the profit he makes. If the spot price of the underlying is higher than the strike price, he lets his option expire un-exercised. His loss in this case is the premium he paid for buying the option.



PAYOFF FOR BUYER OF A PUT: LONG PUT



PAYOFF FOR WRITER OF A PUT: SHORT PUT

4. Payoff profile for writer of put options: Short put

A put option gives the buyer the right to sell the underlying asset at the strike price specified in the option. For selling the option, the writer of the option charges a premium. The profit/loss that the buyer makes on the option depends on the spot price of the underlying. Whatever is the buyer's profit is the seller's loss. If upon expiration, the spot price happens to the below the strike price, the buyer will exercise the option on the writer. If upon expiration the spot price of the underlying is more than the strike price, the buyer lets his option expire un-exercised and the writer gets to keep the premium. Figure 6.4 gives the payoff for the writer of a three month put option (often referred to as short put) with a strike of 2250 sold at a premium of 61.70.

Trading strategies involving stock options (uses of options)

Options open up a lot of possibilities. This means that different strategies can be formulated by using options. Each of these strategies has a different risk/reward profiles. Some are comparatively high risk, like purchasing call and put options. Others are meant to earn profit if specific expectations are met.

All trading strategies involving options may be broadly classified into the following four.

1. Hedging

Hedging involves an attempt to control or manage risk by combining the purchase or sale of an option with some position in the asset.

2. Speculation

Speculation involves the purchase or sale of an option without any position in the underlying asset.

3. Spreading

Spreading is a case when hedging is done within the option market ie, by simultaneous purchase and sale of option of same type.

4. Combinations

Combinations of call options and put options in various ways can also be used to design option strategies. Different types of options strategies can be framed with different perceptions on ris reward combinations. Alternatively, the option strategies can be classified into bullish strategies, bearish strategies and neutral strategies

Option trading strategies

Bullish strategies

- 1. Long call
- 2. Short put
- 3. Call bull spread
- 4. Put bull spread
- 5. Call back spread
- 6. Covered call
- 7. Protective call

bearish strategies

1. Short call

- 2. Long put
- 3. Call bear spread
- 4. Put bear spread
- 5. Put back spread

neutral strategy

- 1. Long straddle
- 2. Short straddle
- 3. Butterfly spread:
- long call butterfly short call butterfly long put butterfly 4. time spread: Call time spread Put time spread 5.condor Long condor

Short condor

Hedging with options

Unique feature of hedging with options is that when combined with position in the asset is protects the losses from the adverse movement while retaining the potential gain from the favourable movement of price. The returns from the favourable side are reduced only marginally by the amount of the premium paid.

We consider hedging with options for long and short position in an asset which need protection against fall and rise in the prices respectively.

1. Hedging long position in stock (the protective put)

The protective put, or put hedge, is a hedging strategy where the holder of a security buys a put to guard against a drop in the stock price of that security. A protective put strategy is usually employed when the options trader is still bullish on a stock he already owns but wary of uncertainties in the near term. It is used as a means to protect unrealized gains on shares from a previous purchase.

Protective Put Construction

Long 100 Shares

Buy 1 ATM Put

The formula for calculating profit is given below:

- Maximum Profit = Unlimited
- Profit Achieved When Price of Underlying > Purchase Price of Underlying + Premium Paid
- Profit = Price of Underlying Purchase Price of Underlying -Premium Paid



2. Hedging short position in stock with call option

Now consider an opposite position with no asset in possession. Many of s would wonder what protection one needs on an asset that is not owned yet. Of course, one has nothing to lose because he does not own. Yet protection is needed if he is intending to own the asset in near future. Possibly one does not have funds to acquire the asset now. Such a position is considered as short position on asset. For short position, the price fall in favourable. But price rise is unfavorable.

3. Income generation through the strategy of writing covered call

Both the strategies discussed above aim at limiting the is of an underlying position in an equity stock option. Both of them may be used for generating returns from the positions in stock. To earn the premium an investor may choose to write a call option expecting that the price will not exceed the exercise price.

4. Income generation through the strategy of writing put

The strategy of writing a covered call is used when no upside movement in price is forecast. Similarly, when one is short on stock and no downside movement is foreseen, an investor can decide to write a put option to increase returns in the short turn.

5. Speculations with single option

This is another trading strategy involving option. Speculative strategy with options are rather simple. When one is bullish he will buy a call option. This call option provides a gain if the market price exceeds the strike price. Similarly under bearish conditions, the investor will buy put option.

Other option trading strategies (combination of options)

Options are very versatile in nature. there are a large number of trading strategies that can be created by combination of options. These strategies are used for trading as well as for hedging purposes. If options are combined with the objective of risk containment it will be called hedging.

1. Straddle

A straddle consists of buying a put option and a call option with the same exercise price and date of expiration. Straddle is an appropriate strategy for an investor who expects a large move in the price but does not now in which direction the move will be. Straddles may be long or short.

Long straddle

A long straddle is an options strategy where the trader purchases

both a long call and a long put on the same underlying asset with the same expiration date and strike price. The strike price is at-the-money or as close to it as possible. Since calls benefit from an upward move, and puts benefit from a downward move in the underlying security, both of these components cancel out small moves in either direction, Therefore the goal of a straddle is to profit from a very strong move, usually triggered by a newsworthy event, in either direction by the underlying asset.



Short Straddle

A short straddle is simultaneous sale of a call and a put on the same stock, at same expiration date and strike price.

Breakeven stock price at expiration

There are two potential break-even points:

1. Strike price plus total premium:

In this example: 100.00 + 6.50 = 106.50

2. Strike price minus total premium: In this example: 100.00 - 6.50 = 93.50

Profit/Loss diagram and table: short straddle

Short 1 100 call at 3.30

Short 1 100 put at 3.20

Total credit = 6.50



2. Strangle

A strangle is a combination of one call option and one put option with different exercise prices but with same expiration date. Strangle may be long or short.

Long strangle

The long strangle, also known as buy strangle or simply "strangle", is a neutral strategy in options trading that involve the simultaneous buying of a slightly out-of-the-money put and a slightly out-of-themoney call of the same underlying stock and expiration date.

Long Strangle Construction

Buy 1 OTM Call

Buy 1 OTM Put

The formula for calculating profit is given below:

- Maximum Profit = Unlimited
- Profit Achieved When Price of Underlying > Strike Price of Long Call + Net Premium Paid OR Price of Underlying < Strike Price of Long Put - Net Premium Paid
- Profit = Price of Underlying Strike Price of Long Call Net Premium Paid OR Strike Price of Long Put - Price of Underlying - Net Premium Paid



Short strangle

The short strangle, also known as sell strangle, is a neutral strategy in options trading that involve the simultaneous selling of a slightly out-of-the-money put and a slightly out-of-the-money call of the same underlying stock and expiration date.

Short Strangle Construction

Sell 1 OTM Call

Sell 1 OTM Put

The short strangle option strategy is a limited profit, unlimited risk options trading strategy that is taken when the options trader thinks that the underlying stock will experience little volatility in the near term. Short strangles are credit spreads as a net credit is taken to enter the trade.

The formula for calculating maximum profit is given below:

- Max Profit = Net Premium Received Commissions Paid
- Max Profit Achieved When Price of Underlying is in between the Strike Price of the Short Call and the Strike Price of the Short Put

3. Strap

Strap is the reverse of strip. In this strategy, the trader buys two call options and one put option at the same strike price and maturity. This strategy is used when the chances of price going up are more than the chances of going it down. Thus, strap is similar to long straddle. The only difference is the quantity traded. When the prices increase, strap strategy will make more profit compared to long straddle because he has bought two calls.

Strap construction

Buy 2 ATM calls

Buy 1 ATM put

Profit or loss

Maximum loss: maximum loss is limited to net premium paid. It occurs when the price of underlying is equal to strike price of calls/ puts

Maximum profit; profit is unlimited. the gains from upside movement would double when two calls become in the money. The gains from upside movement will be larger than straddle and remain same for downside movement.

Breakeven point

There are 2 breakeven points for the strap position. These are calculated as follows.

- Upper breakeven point =strike price of calls/puts+(net premium paid/2)
- Lower breakeven point= strike price of call/puts-Net premium paid)

Strip

A strip is an option strategy that involves the purchase of two put options and one call option all with the same expiration date and strike price. It can also be described as adding a put option to a straddle.

Strip construction

Buy 1 ATM call Buy 2 ATM puts

Profit or loss

Maximum loss: maximum is limited. Maximum loss =net premium paid +commission paid

Maximum profit: profit is unlimited

Breakeven points

There are 2 break even points for the strip position. The breakeven points can be calculated using the following formula

- Upper breakeven point= strike price of calls/puts+ net premium paid
- Lower breakeven point = strike price of calls/puts –(net premium paid/2)

Example

Suppose cash price of stock X Rs. 100. A trader buys one call and two put options at a strike price of Rs. 100 on payment of a premium of Rs. 5 each. His total outflow at the time of buying the strip is Rs. 15(premium). Trader will lose money between the levels of 92.5 and 115 (breakeven points). He will suffer a maximum loss of Rs. 15, if stock price closes at Rs. 100 on expiry. In the case of downward move in price of the underlying stock the two put options generate values for the trader. But in the of an upward move, only one call option generates profit.

The pay of position of s trip buyer is sown in the following diagram.



when price goes down, two puts become in the money. When prices go up only one call become in the money, making gains unequal for same rise than fall in the price.

The strip seller will earn the maximum profit if price of the stock happens to e the strike price of the options, ie, Rs. 100 at expiry of the options. The maximum profit will be equivalent to the total premium received ie, Rs. 15.

5.Option spreads strategy

Combinations, as discussed above are created by using to different types of options on the same asset and same expiration dates, spreads are created with positions on the same type of options on the same asset but with different strike prices.

Thus, an option spread trading strategy involves taking a position in two or more options of the same type simultaneously on same asset but with different strike prices.

Option spread may be classified under three categories

1. Vertical spreads

2. Horizontal spread

3. Diagonal spread

Spread strategies can be evolved for bearish conditions and bullish conditions. Accordingly, spread can be classified into bull spreads and bear spreads.

a. Bull spreads

Bull Spread is a strategy that option traders use when they try to make profit from an expected rise in the price of the underlying asset. It can be created by using both puts and calls at different strike prices. Usually, an option at a lower strike price is bought and one at a higher price but with the same expiry date is sold in this strategy.

Description: In the graphic example shown below, the user has bought a long call at strike price 60 and shorted (sold) a long call at strike price of 65.



Bull put spread

A bull put spread is an options strategy that is used when the investor expects a moderate rise in the price of the underlying asset. The strategy uses two put options to form a range consisting of a high strike price and a low strike price. The investor receives a net credit from the difference between the two premiums from the options.

Bull put spreads can be implemented by selling a higher striking in-the-money put option and buying a lower striking out-of-the-money put option on the same underlying stock with the same expiration date.

If the stock price closes above the higher strike price on expiration date, both options expire worthless and the bull put spread option strategy earns the maximum profit which is equal to the credit taken in when entering the position.

The formula for calculating maximum profit is given below:

- Max Profit = Net Premium Received Commissions Paid
- Max Profit Achieved When Price of Underlying >= Strike Price of Short Put

b. Bear spread

A trader purchases a contract with a higher strike price and sells a contract with a lower strike price. This strategy is used to maximize profit of a decline in price while still limiting any loss that could occur from a steep decrease in price.

Bear call spread

A bear call spread is a type of vertical spread. It contains two calls with the same expiration but different strikes. The strike price of

the short call is below the strike of the long call, which means this strategy will always generate a net cash inflow (net credit) at the outset.

Breakeven stock price at expiration

Strike price of short call (lower strike) plus net premium received.

In this example: 100.00 + 1.80 = 101.80

Profit/Loss diagram and table: bear call spread

Sell 1 XYZ 100 call at 3.30

Buy 1 XYZ 105 call at (1.50)

Net credit = 1.80

Put bear spread

A bear put spread is a type of options strategy where an investor or trader expects a moderate decline in the price of a security or asset. A bear put spread is achieved by purchasing put options while also selling the same number of puts on the same asset with the same expiration date at a lower strike price. The maximum profit using this strategy is equal to the difference between the two strike prices, minus the net cost of the options.

Bear Put Spread Construction

Buy 1 ITM Put

Sell 1 OTM Put

By shorting the out-of-the-money put, the options trader reduces the cost of establishing the bearish position but forgoes the chance of making a large profit in the event that the underlying asset price plummets. The bear put spread options strategy is also known as the bear put debit spread as a debit is taken upon entering the trade.

c. Butterfly spreads

A butterfly spread is an options strategy combining bull and bear spreads, with a fixed risk and capped profit. These spreads, involving either four calls or four puts are intended as a market-neutral strategy and pay off the most if the underlying does not move prior to option expiration.

Long call butterfly

A long butterfly spread with calls is a three-part strategy that is created by buying one call at a lower strike price, selling two calls with a higher strike price and buying one call with an even higher strike price. All calls have the same expiration date, and the strike prices are equidistant.

Short call butterfly

A short butterfly spread with calls is a three-part strategy that is created by selling one call at a lower strike price, buying two calls with a higher strike price and selling one call with an even higher strike price. All calls have the same expiration date, and the strike prices are equidistant.

Long put butterfly

The long put butterfly spread is a limited profit, limited risk options trading strategy that is taken when the options trader thinks that the underlying security will not rise or fall much by expiration.

Short put butterfly

The short put butterfly is a neutral strategy like the long put butterfly but bullish on volatility. It is a limited profit, limited risk options strategy. There are 3 striking prices involved in a short put butterfly and it can be constructed by writing one lower striking out-of-themoney put, buying two at-the-money puts and writing another higher striking in-the-money put, giving the options trader a net credit to put on the trade.

d. Condor spreads

A condor spread is a non-directional options strategy that limits both gains and losses while seeking to profit from either low or high volatility. There are two types of condor spreads. A long condor seeks to profit from low volatility and little to no movement in the underlying asset. A short condor seeks to profit from high volatility and a sizable move in the underlying asset in either direction.

Long condor

A long condor spread with calls is a four-part strategy that is created by buying one call at a lower strike price, selling one call with a higher strike price, selling another call with an even higher strike price and buying one more call with an even higher strike price. All calls have the same expiration date, and the strike prices are equidistant.

Short condor

The short condor is a neutral strategy similar to the short butterfly. It is a limited risk, limited profit trading strategy that is structured to earn a profit when the underlying stock is perceived to be making a sharp move in either direction.

e. Calendar spread

A calendar spread is an options or futures spread established by

simultaneously entering a long and short position on the same underlying asset at the same strike price but with different delivery months. It is sometimes referred to as an inter-delivery, intra-market, time, or horizontal spread.

f. Box spreads

A box spread, also known as a long box, is an option strategy that combines buying a bull call spread with a bear put spread, with both vertical spreads having the same strike prices and expiration dates. The long box is used when the spreads are underpriced in relation to their expiration values. By reading this article, an investor will gain a basic understanding of this complex option trading strategy.

g. Ratio Spreads

The ratio spread is a neutral strategy in options trading that involves buying a number of options and selling more options of the same underlying stock and expiration date at a different strike price. It is a limited profit, unlimited risk options trading strategy that is taken when the options trader thinks that the underlying stock will experience little volatility in the near term.

Settlement of option contracts

- 1. By exercising
- 2. By letting option expire
- 3. By offsetting

Exotic options (non generic options)

Exotic options are the classes of option contracts with structures and features that are different from plain-vanilla options (e.g., American or European options). Exotic options are different from regular options in their expiration dates, exercise prices, payoffs, and underlying assets. All the features make the valuation of exotic options more sophisticated relative to the valuation of plain-vanilla options. Below is a list of various Exotic Options.

Types of Exotic Options

The most common types of exotic options include the following:

1. Asian options

The Asian option is one of the most commonly encountered types of exotic options. They are option contracts whose payoffs are determined by the average price of the underlying security over several predetermined periods of time.

2. Barrier options

The main feature of barrier exotic options is that the contracts become activated only if the price of the underlying asset reaches a predetermined level.

3. Basket options

Basket options are based on several underlying assets. The payoff of a basket option is essentially the weighted average of all underlying assets. Note that the weights of the underlying assets are not always equal.

4. Bermuda options

These are a combination of Amer can and European options.

Similar to European options, Bermuda options can be exercised at the date of their expiration. At the same time, these exotic options are also exercisable at predetermined dates between the purchase and expiration dates.

5. Binary options

Binary options are also known as digital options. The options guarantee the payoff based on the occurrence of a certain event. If the event has occurred, the payoff is a fixed amount or a predetermined asset. Conversely, if the event has not occurred, the payoff is nothing. In other words, binary options provide only all-or-nothing payoffs.

6. Chooser options

Chooser exotic options provide the holder with the right to decide whether the purchased options are calls or puts. Note that the decision can be made only at a fixed date prior to the expiration of the contracts.

7. Compound options

Compound options (also known as split-fee options) are essentially an option on an option. The final payoff of this option depends on the payoff of another option. Due to this reason, compound options have two expiration dates and two strike prices.

8. Extendible options

Extendible option contracts provide the right to postpone their expiration dates. For example, the holder-extendible options allow a purchaser extending their options by a predetermined amount of time if the options are out-of-money. Conversely, the writer-extendible options provide similar rights to a writer (issuer) of options.

9. Lookback options

Unlike other types of options, lookback options initially do not have a specified exercise price. However, on the maturity date, the holder of lookback options has the right to select the most favorable strike price among the prices that have occurred during the lifetime of the options.

10. Spread options

The payoff of a spread option depends on the difference between the prices of two underlying assets.

11. Range options

Range options are also distinguished by their final payoff. The final payoff of range exotic options is determined as the spread between maximum and minimum prices of the underlying asset during the lifetime of the options.

MODULE V SWAPS

Swap refers to an exchange of one financial instrument for another between the parties concerned. This exchange takes place at a predetermined time, as specified in the contract. A swap in simple terms can be explained as a transaction to exchange one thing for another or 'barter'. In financial markets the two parties to a swap transaction contract to exchange cash flows. A swap is a custom tailored bilateral agreement in which cash flows are determined by applying a prearranged formula on a notional principal. Swap is an instrument used for the exchange of stream of cash flows to reduce risk.

The advantages of swaps are as follows:

- 1) Swap is generally cheaper. There is no upfront premium and it reduces transactions costs.
- 2) Swap can be used to hedge risk, and long time period hedge is possible.
- 3) It provides flexible and maintains informational advantages.
- 4) It has longer term than futures or options. Swaps will run for years, whereas forwards and futures are for the relatively short term.
- 5) Using swaps can give companies a better match between their liabilities and revenues.

The disadvantages of swaps are:

- 1) Early termination of swap before maturity may incur a breakage cost.
- 2) Lack of liquidity.
- 3) It is subject to default risk.

Features of Swaps

- Counter Parties:
- Swap involve the exchange of a series of periodic payment between at least two parties.
- Example, a firm having a loan of ten crore payable at ten percent fixed coupon rate for five years, wants to exchange for a floating interest rate with that party who is also interest to exchange its liability from floating to fixed.

♦ Facilitators:

- Swap agreements are arranged through an intermediary which is usually a large international financial institution / bank having network of its operation in major countries.
- These intermediaries plays a significant role in bringing closer the various parties for such deals.
- Facilitator will note down the requirement of the parties and try to match and fulfill these with other parties.

♦ Swaptions:

 Swaptions are combination of the features of two derivative instruments i.e. option and swap.

- Option interest rate swaps are referred as swaptions.
- Buyer of the swaption has the right to enter into an interest rate swap agreement by some specified date in the future.
- Swaption will specify whether the buyer of the swaption will be a fixed rate receiver or a fixed rate payer.
- Buyer exercises the option then the writer of the option will become the counter party.

♦ Equity swap:

- Equity swap involves the exchange of interest payment linked to the change in the stock index.
- Example, an equity swap agreement may allow a company to swap a fixed interest rate of 6 per cent in exchange for the rate of appreciation on a particular index say BSE or NSE index.

Different Types of Swaps

1. Currency Swaps

Cross currency swaps are agreements between counter-parties to exchange interest and principal payments in different currencies. Like a forward, a cross currency swap consists of the exchange of principal amounts (based on today's spot rate) and interest payments between counter-parties. It is considered to be a foreign exchange transaction and is not required by law to be shown on the balance sheet.

In a currency swap, these streams of cash flows consist of a stream of interest and principal payments in one currency exchanged for a stream, of interest and principal payments of the same maturity in another currency. Because of the exchange and re-exchange of notional principal amounts, the currency swap generates a larger credit exposure than the interest rate swap.

Cross-currency swaps can be used to transform the currency denomination of assets and liabilities. They are effective tools for managing foreign currency risk. They can create currency match within its portfolio and minimize exposures. Firms can use them to hedge foreign currency debts and foreign net investments.

Currency swaps give companies extra flexibility to exploit their comparative advantage in their respective borrowing markets. Currency swaps allow companies to exploit advantages across a matrix of currencies and maturities. Currency swaps were originally done to get around exchange controls and hedge the risk on currency rate movements. It also helps in Reducing costs and risks associated with currencyexchange.

They are often combined with interest rate swaps. For example, one company would seek to swap a cash flow for their fixed rate debt denominated in US dollars for a floating-rate debt denominated in Euro. This is especially common in Europe where companies shop for the cheapest debt regardless of its denomination and then seek to exchange it for the debt in desired currency.

2. Credit Default Swap

Credit Default Swap is a financial instrument for swapping the risk of debt default. Credit default swaps may be used for emerging market bonds, mortgage backed securities, corporate bonds and local government bond.
- The buyer of a credit default swap pays a premium for effectively insuring against a debt default. He receives a lump sum payment if the debt instrument is defaulted.
- The seller of a credit default swap receives monthly payments from the buyer. If the debt instrument defaults they have to pay the agreed amount to the buyer of the credit default swap.

The first credit default swap was introduced in 1995 by JP Morgan. By 2007, their total value has increased to an estimated \$45 trillion to \$62 trillion. Although since only 0.2% of Investment Company's default, the cash flow is much lower than this actual amount. Therefore, this shows that credit default swaps are being used for speculation and not insuring against actual bonds.

As Warren Buffett calls them "financial weapons of mass destruction". The credit default swaps are being blamed for much of the current market meltdown.

Example of Credit Default Swap;

- An investment trust owns £1 million corporation bond issued by a private housing firm.
- If there is a risk the private housing firm may default on repayments, the investment trust may buy a CDS from a hedge fund. The CDS is worth £1 million.
- The investment trust will pay an interest on this credit default swap of say 3%. This could involve payments of £30,000 a year for the duration of the contract. If the private housing firm doesn't default. The hedge fund gains the interest from

the investment bank and pays nothing out. It is simple profit.

- If the private housing firm does default, then the hedge fund has to pay compensation to the investment bank of £1 million – the value of the credit default swap.
- Therefore the hedge fund takes on a larger risk and could end up paying £1million

3. Commodity Swap

A commodity swap is an agreement whereby a floating (or market or spot) price is exchanged for a fixed price over a specified period. The vast majority of commodity swaps involve oil. A swap where exchanged cash flows are dependent on the price of an underlying commodity. This swap usually used to hedge against the price of a commodity. Commodities are physical assets such as precious metals, base metals, energy stores (such as natural gas or crude oil) and food (including wheat, pork bellies, cattle, etc.).

In this swap, the user of a commodity would secure a maximum price and agree to pay a financial institution this fixed price. Then in return, the user would get payments based on the market price for the commodity involved.

They are used for hedging against Fluctuations in commodity prices or Fluctuations in spreads between final product and raw material prices.

A company that uses commodities as input may find its profits becoming very volatile if the commodity prices become volatile. This is particularly so when the output prices may not change as frequently as the commodity prices change. In such cases, the company would enter into a swap whereby it receives payment linked to commodity prices and pays a fixed rate in exchange. There are two kinds of agents participating in the commodity markets: end-users (hedgers) and investors (speculators).

4. Equity Swap

The outstanding performance of equity markets in the 1980s and the 1990s, have brought in some technological innovations that have made widespread participation in the equity market more feasible and more marketable and the demographic imperative of baby-boomer saving has generated significant interest in equity derivatives. In addition to the listed equity options on individual stocks and individual indices, a burgeoning over-the-counter (OTC) market has evolved in the distribution and utilization of equity swaps.

An equity swap is a special type of total return swap, where the underlying asset is a stock, a basket of stocks, or a stock index. An exchange of the potential appreciation of equity's value and dividends for a guaranteed return plus any decrease in the value of the equity. An equity swap permits an equity holder a guaranteed return but demands the holder give up all rights to appreciation and dividend income.

Compared to actually owning the stock, in this case you do not have to pay anything up front, but you do not have any voting or other rights that stock holders do have. Equity swaps make the index trading strategy even easier. Besides diversification and tax benefits, equity swaps also allow large institutions to hedge specific assets or positions in their portfolios

5. Interest Rate Swap

An interest rate swap, or simply a rate swap, is an agreement between two parties to exchange a sequence of interest payments without exchanging the underlying debt. In a typical fixed/floating rate swap, the first party promises to pay to the second at designated intervals a stipulated amount of interest calculated at a fixed rate on the "notional principal"; the second party promises to pay to the first at the same intervals a floating amount of interest on the notional principle calculated according to a floating-rate index.

The interest rate swap is essentially a strip of forward contracts exchanging interest payments. Thus, interest rate swaps, like interest rate futures or interest rate forward contracts, offer a mechanism for restructuring cash flows and, if properly used, provide a financial instrument for hedging against interest rate risk.

The reason for the exchange of the interest obligation is to take benefit from comparative advantage. Some companies may have comparative advantage in fixed rate markets while other companies have a comparative advantage in floating rate markets.

When companies want to borrow they look for cheap borrowing i.e. from the market where they have comparative advantage. However this may lead to a company borrowing fixed when it wants floating or borrowing floating when it wants fixed. This is where a swap comes in. A swap has the effect of transforming a fixed rate loan into a floating rate loan or vice versa. In an interest rate swap they consist of streams of interest payments of one type (fixed or floating) exchanged for streams of interest payments of the other-type in the same currency.

Interest rate swaps are voluntary market transactions by two parties. In an interest swap, as in all economic transactions, it is presumed that both parties obtain economic benefits. The economic benefits in an interest rate swap are a result of the principle of comparative advantage. Further, in the absence of national and international money and capital market imperfections and in the absence of comparative advantages among different borrowers in these markets, there would be no economic incentive for any firm to engage in an interest rate swap.

Difference between currency swaps and interest swap

Interest rate swap	Currency swap
1. Cash flows exchanged are	1. Cash flows exchanged are
in the same currency.	in two different currencies.
2. There is only one notional	2. There are two notional
principal amount.	principal amounts
3. Notional principal amount	3. Notional principal amounts
is not exchanged.	are exchanged
4. No counter party risk is	4. Counter party risk is
involved	involved
5. Benchmark rate is MIBOR	5. Benchmark rate is LIBOR
for all domestic swaps	

Difference Between Swap and Future

- Swaps and futures are both derivatives, which are special types of financial instruments that derive their value from a number of underlying assets.
- A swap is a contract made between two parties that agree to swap cash flows on a date set in the future.
- A futures contract obligates a buyer to buy and a seller to sell a specific asset, at a specific price to be delivered on a predetermined date.
- Futures contract are exchange traded and are, therefore, stan-

dardized contracts, whereas swaps generally are over the counter (OTC); they can be tailor made according to specific requirements.

• Futures require a margin to be maintained, with the possibility of the trader being exposed to margin calls in the event that the margin falls below requirement, whereas there are no margin calls in swaps.

Swap derivative

When swaps are combined with options and forwards, we shall derive some other derivatives, for example, when swap is combined with forward, we get a new derivative called forward swap. It combines the features of swaps and forwards. Similarly, when swap is combined with option, we get an innovative derivative called swaption. This combines the features of swap and option. Thus forward swaps and swaptions are swap derivative. They are derived from swaps.

Non generic or exotic swaps

A number of new generation swaps have been emerged in recent years, they have unusual features, their structure are very complex. They are non standard swaps.

Their coupon, notional, accrual and calendar used for coupon determination and payments are tailor made to serve client perspectives and needs in terms of risk management, accounting hedging, asset repackaging, credit diversification etc, such swaps are called nongeneric or exotic swaps.

Some of the very popular first generation non generic swaps may be briefly discussed as follows.

- 1. Forward staring swap
- 2. Roller coaster swap
- 3. Amortising swap
- 4. Accreting swap
- 5. Constant maturity swap.
- 6. In arrear swap
- 7. Quanto swap
- 8. Leveraged swap
- 9. Power swap
- 10. Overnight index swap

The first generations of non generic swaps have been widely used for asset and liability management as well as simple trading strategies. Some of the second generation non generic swaps may be outlined as below.

1. index amortising swap	5. bermudan swaps.
2. Range accrual swaps	6. Asian swaps
3. Digital swap	7. Barrier swap
4. Chooser swap	8. Corridor swap