6th SEMESTER B.COM FINANCE

CALICUT UNIVERSITY

FINANCIAL DERIVATIVES

2018 ADMISSION

SEMESTER NOTE

Prepared by

ILLYAS.K.P

Assistant professor

Department of commerce & management

SYLLABUS

BCM6B15 FINANCIAL DERIVATIVES
Lecture hours: 5, Credits: 5
Internal: 20, External: 80, Examination 3 Hours

• To acquire knowledge about financial derivatives and their features.
• To know about various risks associated with derivatives.

Module I
Financial Derivatives: Introduction – Meaning – Types of financial derivatives: Forwards – Futures – Options – Swaps – Economic functions of derivative contracts. **(12 Hours, 10 marks)**

Module II
Derivative Markets: History of financial derivative market – Participants in a derivative market – Cash market Vs derivative market – Stock market derivatives in India – Other derivatives in India – The regulatory frame work for derivatives trading in India.
(15 Hours, 20 marks)

Module III
Forward Contracts: Features – Limitations of forward markets – Introduction to Futures – Meaning and definition – Features of futures – Difference between forwards and futures – Futures – terminology – Types of future contracts – Financial futures – Stock futures – Currency futures – Interest rate futures – Index futures – Commodity futures – Futures pay offs – Trading strategies in stock futures. **(20 Hours, 20 marks)**

Module IV
Options: Meaning – Definition – Need – Difference between options and futures – Fundamental option strategies – Types of options contracts – Call – Put – options – Intrinsic value Vs Time value of options – Trading strategies in stock options.
(20 Hours, 20 marks)

Module V
Swaps: Meaning – Definition – Features of swaps – Terms used in swaps – Types of swaps: Interest rate swap – Currency swap – Commodity swap – Equity swap – Difference between Swaps and Futures. **(13 Hours, 10 marks)**

Reference Books:
1. Hull John. C, Options, Futures and Other Derivatives, Pearson Educations Publishers, New Delhi (Latest Edition).
2. S.L.Gupta, Prentice Hall of India Private Ltd, New Delhi.
3. L.M Bhole, Financial Institutions and Markets – Structure, Growth and Innovations, Tata Mc Graw Hill Publishing Co. Ltd. New Delhi.
4. D.C. Patwari&A.Bhargava, Options and Futures, an Indian Perspective, JAICO Publishing

MODULE 1

INTRODUCTION TO 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.

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 differs 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.

Classification of Derivatives (Types of Derivatives)

a. On the basis of nature of payoff or nature of contract
b. On the basis of underlying assets
c. On the basis of trading mechanism

On the basis of nature of payoff or nature of contract

It may be classified into forwards, futures, options and swaps

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. It is a bilateral agreement. Forward contracts are unstandardized. They are not traded on stock exchanges they are generally traded on over the counter (OTC).

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 traded on stock exchanges. The exchange guarantees and ensures the execution of the contract by both the parties. The contract value is adjusted according to market movements till the expiration date.

Options: An option refers to the right (but not the obligation) to buy or sell a security or other assets during a given time for a specified price. The specified price is called strike price. 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.

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 cash flows are based on a notional principal amount agreed between both the parties without exchanging principal amount. The amount of cash flows is based on a rate of interest. One cash flow is generally fixed and the other is variable. Swaps are not traded on stock exchanges.

On the basis of underlying assets

They can be classified into two, namely, commodity derivatives and financial derivatives.

1. **Commodity Derivatives:** 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.
2. **Financial Derivatives**: 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.

Difference between commodity derivatives and financial derivatives

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 and silver. : In a financial derivative, the underlying instrument may be financial instrument such as bonds, stocks, stock indices and currencies.

A financial derivative is fairly standard and there are no quality issues whereas in commodity derivative, the quality may be the underlying matter.

In the case of financial derivatives, most of the contracts are cash-settled. Even in the case of physical settlement, financial assets are not bulky. They do not need special facility for storage. But in the case of commodity derivatives, generally the underlying assets are bulky. Due to the bulky nature of the underlying assets, physical settlement in commodity derivatives creates the need for warehousing.

On the basis of trading mechanism

According to the markets or places the derivatives are traded, they can be classified into two – Exchange Traded Derivatives and Over The Counter Derivatives.

1. **Over the Counter Derivatives**: (OTC) derivatives or off-exchange trading is to trade financial instruments such as stocks, bonds, commodities or derivatives directly between two parties without going through an exchange or other intermediary.
   ■ The contract between two parties are privately negotiated.
   ■ The contract can be tailor-made to the two parties' liking.
   ■ OTC markets are uncontrolled, unregulated and have very few laws. It is more like a free fall.

Merits of OTC Derivatives:

a. Limitless flexibility in contract design
b. These are customised to the requirements of contracting parties
c. The underlying asset can be anything, the size of the contract can be of any amount, and the delivery can be made at any time and at any location.

Demerits of OTC Derivatives

a. It is difficult to find matching parties
b. There is credit risk. It means that one of the parties to the contract may fail to honour the obligations.
c. There is skewed pricing as two parties are not equally strong.
d. Transaction cost is high.

2. **Exchange Traded Derivatives**: Exchange Traded derivative contracts are those derivative instruments that are traded via specialized Derivative exchange or other exchanges. A derivatives exchange is a market where individuals trade standardized contracts that have been defined by the exchange.
   ■ The world's largest derivative exchange (by number of transactions) is the **Korea Exchange**
   ■ There is a very visible and transparent market price for the derivatives

Merits of Exchange Traded Derivatives:

a. Free from counter party risk
b. Transaction cost is transparent and nominal
c. Investors can enter and exit from derivative positions very conveniently as trading takes place continuously.

Demerits of Exchange Traded Derivatives

a. Less flexible
b. These are not customised to the requirements of the contracting parties. They have to accept the rules and regulations of the exchange.

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Difference between Exchange Traded and OTC Derivatives

Exchange Traded Derivatives	OTC Derivatives
1. Do not have any counter party risk	1. Counter party risk is present
2. Contracts that traded on an organised exchange	2. OTC derivatives result from agreements between two parties
3. Transaction costs are less	3. Transaction costs are more
4. The contracts have standardised terms set by the exchange or clearing house	4. Contracts are customised to the requirements of the counter party
5. Prices are publicly available	5. Prices are not available(kept confidential)
6. Market traders do not know each other	6. Market players are known to each other

FINANCIAL DERIVATIVES

Financial derivatives constitute the largest segment in derivatives. A financial derivative is a financial contract that derives its value from an underlying asset. The underlying asset may be stocks or bonds or interest rates or currencies. The seller of the contract doesn't have to own the underlying asset. Financial derivatives are also known as *common derivatives.*

Features of financial derivatives

1. It is a financial instrument or a financial contract.
2. It is a future contract between two parties.
3. Its value depends on the value of the financial instruments.
4. It can be undertaken directly between the two parties or through the particular exchange.
5. The trading results through financial derivatives are not shown in the financial statements.
6. Usually in financial derivatives, the taking or making delivery of underlying asset is not involved.

Types of Financial Derivatives

a. **Currency Derivatives:** Exchange rates between various currencies can form the basis of derivatives. The currencies can be US Dollar, Canadian Dollar, Singapore Dollar, Euro, Yen etc. Currency derivatives came into existence only after 1972 when the fixed exchange rate regime under Bretton Woods System came to an end. The first derivative on financial asset was traded on currencies (currency futures) in the International Monetary Market of the Chicago Mercantile Exchange, USA in 1972.
b. **Interest Rate Derivatives:** In the case of interest rate derivatives, the underlying asset is interest rates. Most common interest rates on which derivatives are traded are London Inter Bank Offer Rate(LIBOR), or instruments whose value is dependent upon interest rate such as T-bills and Treasury bonds.
c. **Equity Derivatives:** The most popular derivatives are equity derivatives. Here the underlying assets are equity stocks. Futures and options are very widely traded derivatives on equity stocks.
d. **Stock Indices Derivatives:** Derivatives on various stock indices in the stock markets are more popular now-a-days. This is because of their ability to provide protection from market risks. Futures and options on stock indices exist all over the world in all major stock exchanges. In the case of stock index derivatives, delivery of the asset is not possible.
e. **Credit Derivatives:** These are derivatives that are based on the credit rating or credit risk of cash flows such as instalment on loans or other forms of receivables. There are six credit

derivatives commonly used. They are (1) credit default swaps, (2) total return swaps, (3) credit-linked notes, (4) credit spread options, (5) credit basket swaps and (6) collateralised loan obligations. These products transfer credit risk without the transfer of ownership. Thus, credit derivatives include a range of products designed to manage credit risk or default risk.

f. Other Types of Financial Derivatives:

i. **Warrants:** Options generally have lives of up to 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.

ii. **LEAPS:** The acronym LEAPS means Long term Equity Anticipation Securities. These are options having a maturity of up to three years.

iii. **Baskets:** Basket options are options on portfolios of underlying assets. The underlying asset is usually a moving average of a basket of assets. Equity index options are a form of basket options.

iv. **Convertibles:** These are hybrid securities. They combine the basic attributes of fixed interest and variable return securities. E.g.:- convertible bonds, convertible debentures, convertible preference shares. These are also called equity derivative securities. They can be fully or partly converted into equity shares of the issuing company at predetermined terms.

(Financial derivatives may also be classified into forwards, futures, options, swaps, warrants, convertibles, swaptions, etc.)

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 least 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

4. Increased bankruptcies

5. Increased regulatory burden

6. Enhancement of risk

7. Speculative and gambling motives

8. Instability of the financial system

RISK INVOLVED IN DERIVATIVES

1. **Counterparty Risk:** This is the risk which arises when one of the parties involved in a derivative trade (buyer or seller or dealer) makes default on the contract. It is also called credit risk or default risk.

2. **Market risk**: It arises due to adverse movements in the price of a financial asset or commodity. In short, market risk refers to the general risk in any investment

3. **Basis risk:** It is a type of market risk. It refers to the difference between the spot market price of the asset being hedged and the derivative's price.

4. **Interconnection risk:** One market can greatly affect what happens to another market, and that market affects another market, and so on. If an investor is in this situation, it is possible for him to lose his whole investment.

5. **Operation risk**: It arises when internal systems are not capable of managing the transaction.

6. **Liquidity risk**: Most derivatives are customised instruments. Hence, investors may not be able to close out (or finish) a trade prior to maturity.

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. Transaction costs are lower
3. The risk of holding underlying assets is lower
4. It gives increased liquidity for investors.
5. Leads to faster execution of transactions.
6. Enhances the price discovery process.
7. Facilitates the transfer of risk from risk-averse investors (hedgers) to risk takers(speculators).
8. Increases the savings and investments in the economy.

Role or functions of Derivative Markets

1. Discovery of prices
2. Management of risk
3. Provision of liquidity.
4. Portfolio management
5. Trading catalyst
6. Smoothening out the seasonable price variations
7. Promoting savings and investment.

Major players or participants in the Derivative Markets

The participants in the derivative markets can be banks, foreign institutional investors, corporates, brokers, individuals etc. All of them can be classified into four depending upon their motives. They are: hedgers, speculators, arbitrageurs and spreaders. They have different motives.

1. Hedgers

A hedger is someone who faces risk associated with price movement of an asset and who uses derivatives as means of reducing risk. They provide economic balance to the market.

Functions of hedgers:

a. To eliminate the price risk of contracting parties
b. To help to increase the trading volume
c. To attract more people into the derivative market.

2. Speculators

A trader who enters the futures market for pursuit of profits, accepting risk in the endeavour. They provide liquidity and depth to the market.

There are three types of speculation (based on duration)

a. Scalpers(hold for very short time-in minutes
b. Day traders (one trading day), and
c. Position traders (long period- week, month, a year)

Functions of Speculators:

a. To contribute to market efficiency
b. To conduct fundamental analysis and/or technical analysis and collect information to predict price movements.
c. To provide liquidity to the market.
d. To find matching parties for the contract and help hedgers.
e. To make the market competitive
f. To reduce transaction costs and
g. To expand the market size.

3. Arbitrageurs

Arbitrage is the process of simultaneous purchase of securities or derivatives in one market at a low price and sale of the same in another market at a relatively higher price. Arbitrageur is a person simultaneously enters into transactions in two or more markets to take advantage of the discrepancies between prices in these markets.

Arbitrage involves making profits from relative mispricing. Arbitrageurs also help to make markets liquid, ensure accurate and uniform pricing, and enhance price stability. They help in bringing about price uniformity and discovery.

Functions of arbitrageurs

1. To provide a link between the derivatives market and the cash market by synchronising prices in the two.
2. To make markets efficient by taking riskless positions in the different markets.
3. To restore the balance and consistency among the different markets.
4. To render competitiveness to the market and help in the price discovery process.

4. Spreaders

Spreading is a specific trading activity in which offsetting position is involved (i.e., simultaneous long and short positions on the same derivative). A spreader is a person who believes in lower expected return at the reduced risk.

Difference between Hedging and Speculation

Hedging	Speculation
1. Transfer of price risk faced by a person or organisation to others who are willing to bear the risk for windfall profit.	1. Buying and selling of financial instruments and derivatives in the hope of a profit from anticipated changes in the price of instruments.
2. The main aim is to cover or eliminate or	2. The main aim is to make profit from short

minimise risk 3. Hedging may be long or short. 4. Risk is less. 5. Complicated process.	term fluctuations. 3. Speculation may be constructive or destructive. 4. Risk is high 5. Easy process.

Difference between Speculation and Arbitrage

Speculation	Arbitrage
1. Buying and selling of financial instruments and derivatives in the hope of a profit from anticipated changes in the price of instruments. **2.** Profit is the differences between prices at different times **3.** Risk is high. **4.** It is a necessary evil. 5. May or may not hold securities/commodities	1. Simultaneous buying and selling of securities or commodities to make profit on the differences in the prices prevailing in the two markets. 2. Profit is the difference between prices prevailing in two different markets. 3. Risk is relatively less(if executed properly 4. It is a legal way to make money. 5. Always hold securities/commodities

DIFFERENCE BETWEEN CASH MAKET AND DERIVATIVE MARKET

Cash market	Derivative market
1. Trading takes place for spot delivery 2. Only tangible commodities such as agricultural products, metals, minerals, shares, debentures are traded. 3. The objective of the dealing party is consumption or investment. 4. The assets are traded at the prevailing prices. 5. Contracts are generally settled through physical delivery. 6. In derivatives market, the initial flows involved in terms of margin are much lesser than the full cash price payable in the cash market.	1. It is meant for future delivery. 2. In addition to these tangibles, some intangibles such as interest rates, credit standing, weather etc. are traded. 3. The objective may be hedging or speculation or investment. 4. The contracts are traded at the prices which are derived from the cash market plus a cost of carry. 5. The contracts can be settled by offsetting contracts or by physical delivery (if allowed) or even cash settlement (of difference between spot price and agreed price). 6. In derivatives market, the initial flows involved in terms of margin are much lesser than the full cash price payable in the cash market.

Factors contributing to the Growth of Derivatives (or Derivative markets)

1. Price volatility
2. Globalisation of markets
3. Technological development
4. Advancements in financial theories
5. Development of sophisticated risk management tools

Growth and development of derivative market in India

Derivative markets 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.

Recently trading in commodity derivatives began through two nation-wide, on-line commodity exchanges,-

- The *National Commodities and Derivatives Exchange (NCDEX)* and
- The *Multi Commodity Exchange (MCX)*

They started functioning in the last quarter of 2003 with the introduction of futures contracts on various assets such as gold, silver, rubber, steel, etc. these exchanges were promoted by the major banks and financial institutions in the country.

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 derivative markets. Technological advances involve computer and internet technologies. These developments encouraged not only the modelling 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 competition and forced industries to become competitive.

B. Internal factors

The following are internal factors that have contributed to the growth of financial derivative 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.

Exchange Traded Financial Derivatives for Risk Management in India

Exchange traded financial derivatives are a recent phenomenon in India. Prior to their arrival, there was an indigenous mechanism of meeting the settlement requirements. In some sections it is also termed as forward trading (forward contracts are not exchange-traded derivatives). It prevailed mostly on the stock exchanges at Mumbai, Ahmedabad, and Kolkata and now on NSE in the name of ALBM (Automated Lending and Borrowing Mechanism).

Badla trading thrived during the days when the equity markets functioned in the account period settlement mode, where in all the trades done are grouped into predetermined periods and are settled on a particular day.

In India, the exchange-traded derivatives have been emerged with the enactment of Securities Laws (Amendment) Act 1999. According to this Act, the derivatives are defined as to include:

a. A security derived from a debt instrument, share, loan whether secured or unsecured, risk instrument or contract for differences or any other form of security, and
b. A contract which derives its values from the prices or index of prices of underlying securities.

The Act also clarified that derivatives shall be legal and valid only if such contracts are traded on a recognised stock exchange in accordance with the rules and bye-laws of such stock exchange, thereby excluding OTC derivatives.

The first exchange to commence derivatives trading is BSE from June 9, 2000. NSE started operations in the derivatives segment on June 12, 2000. Initially, only futures contracts on market index were traded. Subsequently, other derivative products were also introduced. Now the contracts being traded on the exchanges are:-

a. Futures on indices
b. Options on indices
c. Futures on individual securities
d. Options on individual stocks, and
e. Interest rate futures.

On NSE and BSE, only financial derivatives are traded. But recently three exchanges NCDEX, MCX and NDEX commenced trading in commodity futures.

Trading of derivatives contracts on both NSE and BSE is through an order-driven automated online system. For the trading of derivatives, NSE and BSE adopted various forms of computerised trading platforms such as NEAT (National Exchange for Automated Trading), F&O (Futures & Options) of NSE, and DTSS (Derivatives Trading and Settlement System) of BSE. These systems are actually electronic limit order book for recording and executing orders.

In India, derivatives trading are dominated at NSE. It stands amongst the top ten exchanges in the world in terms of number of contracts traded.

Regulatory framework of Derivatives Trading in India

The first step towards introduction of derivatives trading in India was the promulgation of the Securities Laws (Amendment) Ordinance 1995. This withdrew the prohibition on options in securities. The market for derivatives, however, did not take off, because there was no regulatory framework to govern trading of derivatives. SEBI set up a 24-member committee under the chairmanship of Dr.L.C.Gupta on November 18, 1996 to develop appropriate regulatory framework for derivatives trading in India. The committee submitted its report on March 17, 1998.

SEBI also set up a group in June 1998 under the chairmanship of Prof.J.R.Varma, to recommend measures for risk containment in derivatives market in India. The group submitted its report in October 1998.

The Securities Contracts Regulation Act was amended in December 1999 to include derivatives as securities. In this way the regulatory framework was developed for governing derivatives trading. The Act also made it clear that derivatives shall be legal and valid only if such

contracts are traded on a recognised stock exchange, thus precluding OTC derivatives. The Govt.also rescinded in March 2000, the three-decade old notification, which prohibited forward trading in securities.

Derivatives trading commenced in India in June 2000 after SEBI granted the final approval to this effect in May 2000. SEBI permitted the derivative segments of two stock exchanges, NSE and BSE, and their clearing house/corporation to commence trading and settlement in approved derivatives contracts. To begin with, SEBI approved trading in index futures contracts based on S&P CNX Nifty and BSE-30 (Sensex) index. The trading in index options commenced in June 2001. The trading in options on individual securities began in July 2001. Futures contracts on individual stocks were introduced in November 2001.

Measures Taken by SEBI for the Protection of Investors in the Derivative Market.

1. Investor's money has to be kept separate at all levels and is permitted to be used only against the liability of the investor and is not available to the trading member or clearing member or even any other investor.
2. The trading member is required to provide every investor with a Risk Disclosure Document. This document will disclose the risks associated with the derivative trading so that investors can take a conscious decision to trade in derivatives.
3. Investor would get the contract note duly stamped for receipt of the order and execution of the order. The order will be executed with the identity of the client and without client identity, order will not be accepted by the system. The investors could also demand the trade confirmation slip with his identity in support of the contract note. This will protect him from the risk of price favour, if any, extended by the member.
4. In the derivative markets, all money paid by the investor towards margins on all open positions is kept in trust with the Clearing House/Clearing Corporation. In the event of default of the trading or clearing member, the amounts paid by the client towards margins are segregated and not utilised towards the default of the member. However, in the event of a default of a member, losses suffered by the investor, if any, on settled or closed out position are compensated from the Investor Protection Fund.

MODULE 3

FORWARD CONTRACTS

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 clients. 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 parties 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 often 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 Forwards and Futures

Basis	**Forward**	**Futures**
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 standardized contract, traded on a futures exchange, to buy or sell a certain underlying instrument at a certain date in the future, at a specified price.
Structure & Purpose	Customized to customer needs. Usually no initial payment required. Usually used for hedging.	Standardized. Initial margin payment required. Usually used for speculation.
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 Commission or CFTC is the governing body)
Institutional guarantee	The contracting parties	Clearing House
Risk	High counterparty risk	Low counterparty risk
Guarantees	No guarantee of settlement until the date of maturity only the forward price, based on the spot price of the underlying asset is paid	Both parties must deposit an initial guarantee (margin). The value of the operation is marked to market rates with daily settlement of profits and losses.
Contract Maturity	Forward contracts generally mature by delivering the commodity	Future contracts may not necessarily mature by delivery of commodity.

Expiry date	Depending on the transaction	Standardized
Method of pre- termination	Opposite contract with same or different counterparty. Counterparty risk remains while terminating with different counterparty.	Opposite contract on the exchange.
Contract size	Depending on the transaction and the requirements 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 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 tailor- made 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 well- established 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

1. Commodity Futures Market – a physical or electronic marketplace where traders buy and sell commodity futures contracts.

2. Commodity Futures Contracts – purchase and sales agreements 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.

5. 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.)

6. 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 clearinghouse 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 contract. 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 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

Features of Currency futures

The Features of currency futures are:

- → High Liquidity or currency risks, or to speculate on price movements in currencies.
- → 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 unfavourable 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 portfolio 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 market. 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 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 continuous 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 5.3shows 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 5.4shows 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 investor sells 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 benefits 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 cash- settled. 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 4

OPTIONS

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.

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 ofRs.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.

Features of options

1. Contractual agreement that gives the buyer the right , but not the obligation, to buy or sell a specified asset at a specified price on or within a specified period.

2. There are two parties to an option contract. One is buyer (investor or owner) who buys the right. Second is writer (seller) who sells the right (to buy or sell) to the buyer.

3. The seller of option sells the right to choose to the buyer in return for a payment called premium. Hence option is somewhat similar to insurance.

4. The buyer of option may exercise his right or may not exercise his right. He will exercise his right only when it is beneficial for him by doing so. He shall not exercise the option He shall let the option expired. Then he will lose the premium paid. It becomes a gain to the seller.

5. The seller has no choice. He has no right. He has only obligation. This means that he must meet his obligation when the buyer exercises his right.

6. There are two types of option-call option and put option.

7. The buyer of option should exercise his right at any time during the period of contract, i.e., at any time between the signing of the contract and the expiry date (American style). This intervening

period is called expiration period. If the buyer does not exercise the option within the specified period, the option gets expired.

8. The specified or agreed price at which the owner is allowed to buy/sell the specified asset is called exercise or strike price. It is the price at which the option (right) is exercised It is based on the current quoted prices.

Parties to option contracts

1. Purchaser/investor/holder - who buys the option
2. Writer/seller - who sells the option

Important terms (option terminology)

1. *Exercise price/strike price* – option price
2. *Spot price* – current market price of the underlying asset
3. *Underlying* – the asset on which option is traded.
4. *Premium* – the amount paid by the option buyer to option seller
5. *Exercise date* – date on which option is actually exercised.
6. *Expiration date* – the date on which option expires

Need for options

- Capital gain
- Tax advantage
- Control their right on underlying asset
- Enjoy a much wider risk return conditions
- Possibility of gi8ving a windfall profit
- Reduce total portfolio transaction cost
- Better return with limited amount of investment
- Additional income on stock holdings
- Gives the ability to participate when the market is moving upwards, downwards or sideways.

Advantages

- Once premium paid, no further cash is payable by the buyer
- Limit the downside of risk, without limiting upside(limit the loss, but maximise profit)
- No obligation to exercise
- Used for heding,combined with futures and forwards to achieve more complex hedges
- Used for hedging as well as speculation

Limitations

- Premium payable, if volatility is high – premium amount is also high
- Factors affecting option premiums are very complex
- Future have more liquidity than options

Positions in the Options 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.

Option	Buyer	Seller
Call	Right to buy	Obligation to sell
Put	Right to sell	Obligation to buy

Difference between futures and options

Futures	options
1. Both the parties are obliged to perform the contract (buy or sell the underlying asset).	1. Only the seller (writer) is obliged to perform the contract.
2. Margin is the basis of the contract.	2. Option premium is the basis of the contract.
3. Both buyers and sellers face the possibility of unlimited gain or loss.	3.Buyers have the possibility of unlimited profit but their losses are limited. Sellers have the possibility of limited profit. But their losses are unlimited.
4. Preferential contracts for the speculators to maximise profit.	4. Preferential contracts for the hedgers to minimise risk.
5. It has to be honoured by both the parties only on the specified date.	5. It can be exercised by the buyer at any time during the life of the contract or option period.
6. Cost of carry model, backwardation model, expectation model and CAPM	6. Binomial model and Black Sholes model

Difference between forwards and options

Forwards	options
1. Both buyer and seller have obligations.	1. Only the seller has an obligation (buyer had option but not an obligation).
2. Customised contract.	2. Standardised contract.
3. Not traded in stock exchanges.	3. Trade in stock exchanges.

4. There is no premium and margin.	4. The buyer pays premium to the seller, while the seller deposits margin initially with subsequent deposits made depending on the market.
5. Expiry date depends upon the transactions.	5. American options can be exercised at any time during the life of the contract.

Classification of options (Types of Option contracts)

A. Classification on the basis of right

1. Call option

Call options are contracts that give the owner the right to buy the underlying asset in the future at an agreed price.it is useful when prices are rising. 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.

Under favourable circumstances, the buyer may choose to exercise the option. Under unfavourable circumstances (when the spot rate falls below the exercise price), the buyer shall not exercise the option.

2. Put option

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 pre-determined 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.

B. **Classification on the basis of style of exercise**

1. American Style

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.

2. European Style

European options are options that can be exercised, only on the expiry date (maturity). In India, European options are not used.

3. Bermudan Option

A Bermudan option can be exercised on a few specific dates prior to expiration. The name 'Bermuda' was chosen perhaps because Bermuda is half way between America and Europe.

C. **Classification on the basis of nature of underlying assets**

1. **Commodity Options**: The underlying asset for a contract of this type can be either a physical commodity or a commodity futures contract.
2. **Forex/Currency Options**: Contracts of this type grant the owner the right to buy or sell a specific currency at an agreed exchange rate.
3. **Stock Options**: The underlying asset for these contracts is shares in a specific publically listed company.
4. **Stock 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.stock index option enables investors to trade in general stock market movements. The stock price

movement will reflect in stock index option prices.in stock index option, the transactions are settled by payment of cash.

D. **Classification on the basis of trading place**

1. **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.
2. **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.

Other types of options

1. **Real option**:-it is a choice that an investor has when investing in the real economy (i.e., in the production of goods or services, rather than in financial contracts).
2. **Vanilla and exotic option**: A vanilla option is a 'simple' or well understood option. But exotic options are more complex or less understood. European options and American options on stock and bonds are generally considered to be 'plain vanilla'. Asian options, look back options, barrier options (hybrid options) are exotic.
3. **Warrants:** these are long dated options. These are generally traded over the counter.
4. **LEAPS:** LEAPS means Long term Equity Anticipation Securities. These are options having a maturity of upto three years.
5. **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

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 in-the-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 cash flow to the holder if it were exercised immediately. A call option on the index is said to be in the-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 cash flow 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 cash flow 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

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

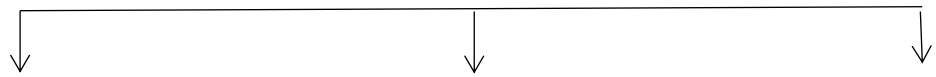
Spreading is a case when hedging is done within the option market ie, by simultaneous purchase and sale of option of same type.

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	***bearish strategies***	***neutral strategy***
1. Long call	1. Short call	1. Long straddle
2. Short put	2. Long put	2. Short straddle
3. Call bull spread	3. Call bear spread	3. Long strangle
4. Put bull spread	4. Put bear spread	4.Short strangle
. 5. Call back spread	5. Put back spread	5.Butterfly spread:
6. Covered call		long call butterfly
7. Protective put		short call butterfly
		Long put butterfly
		Short put butterfly
		4. Time (calendar) spread:
		Call time spread
		Put time spread
		5. Condor:
		Long condor
		Short condor

FUNDAMENTAL OPTION STRATEGIES

1. Long call
    - Purchase of a call option
    - Buys the right to purchase the stock (call option) rather than just buying the stock
    - Trader buys the option instead of shares
    - Expectation=price rise
    - BEP=strike price of long call + premium paid
    - This strategy is adopted when an investor is bullish on market direction(expect a price rise) and bullish on market volatility(unlimited profit, limited loss)
2. Short call
    - Selling(writing) of a call option
    - Sells the right to purchase the stock (call option) rather than just selling the stock
    - Very risky-profit limited, loss unlimited
    - Expectation=price falls
    - BEP=strike price of short call + premium
    - This strategy is adopted when an investor is bearish on market direction(expect a price fall) and bearish on market volatility(limited profit, unlimited loss)
3. Long put
    - Purchase of a put option
    - Buys the right to sell the stock (call option) rather than just buying the stock
    - Expectation=price falls below the strike price
    - BEP=strike price of long put - premium paid
    - This strategy is adopted when an investor is bearish on market direction(expect a price fall) and bullish on market volatility(unlimited profit, limited loss)
4. Short put
    - Selling(writing) of a put option

- Sells the right to sell the stock (put option) rather than just selling the stock
- Very risky-profit limited, loss unlimited
- Expectation=price rise
- BEP=strike price of short put - premium
- This strategy is adopted when an investor is bullish on market direction(expect a price rise) and bearish on market volatility(limited profit, unlimited loss)

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)[synthetic long call]

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.

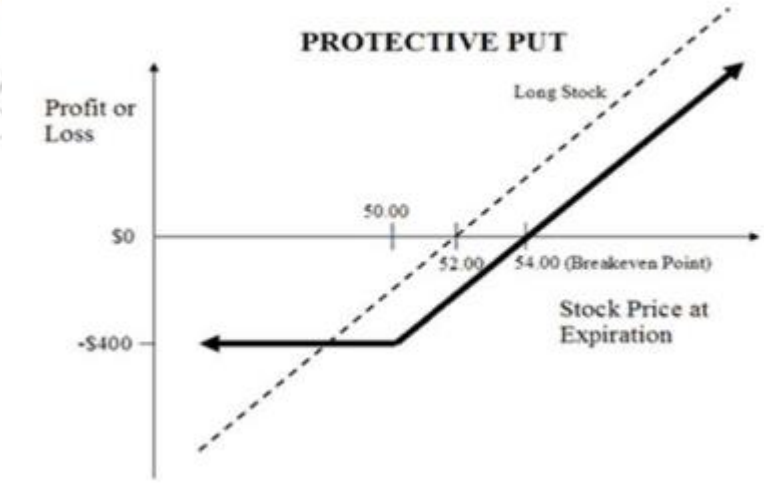
Protective Put Construction

Long 100 Shares

Buy 1 ATM Put

Maximum Profit = Unlimited

Maximum Loss = limited



2. Hedging short position in stock with call option

Now consider an opposite position with no asset in possession. Many of us 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 falls is favourable. But price rise is unfavourable.

3. Income generation through the strategy of writing covered call

Both the strategies discussed above aim at limiting the risk 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 is 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)

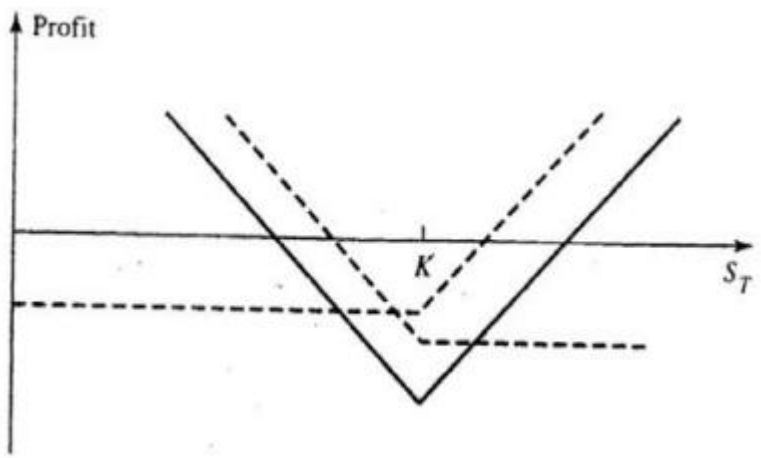
1. Straddle
2. Strangle
3. Strap
4. Strip
5. Options spread strategy

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.

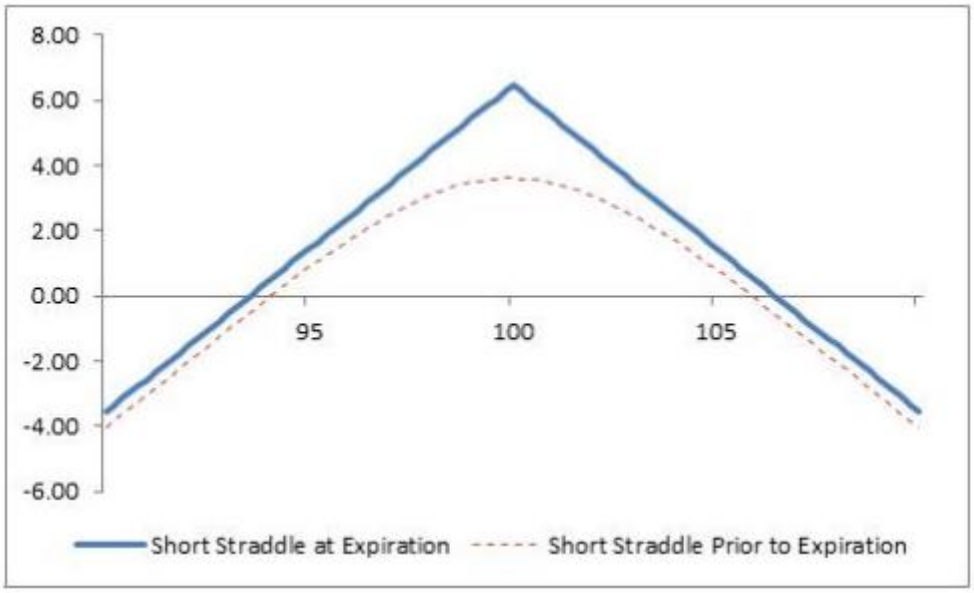
Long straddle

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.



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-the-money call of the same underlying stock and expiration date.

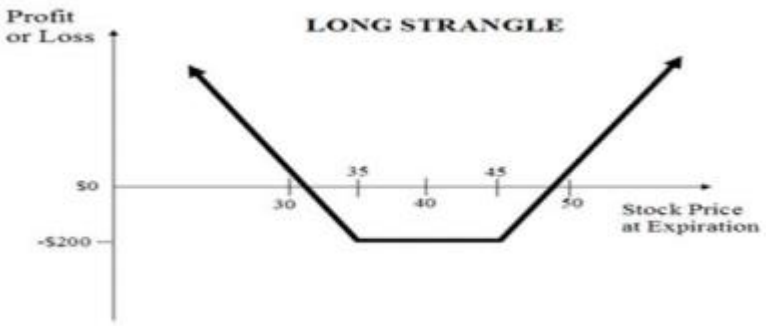
Long Strangle Construction

Buy 1 OTM Call

Buy 1 OTM Put

Maximum Profit = Unlimited

Maximum Profit = Limited to total premium paid for call and put option



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

Limited profit

Unlimited loss

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.

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 points

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 loss 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.

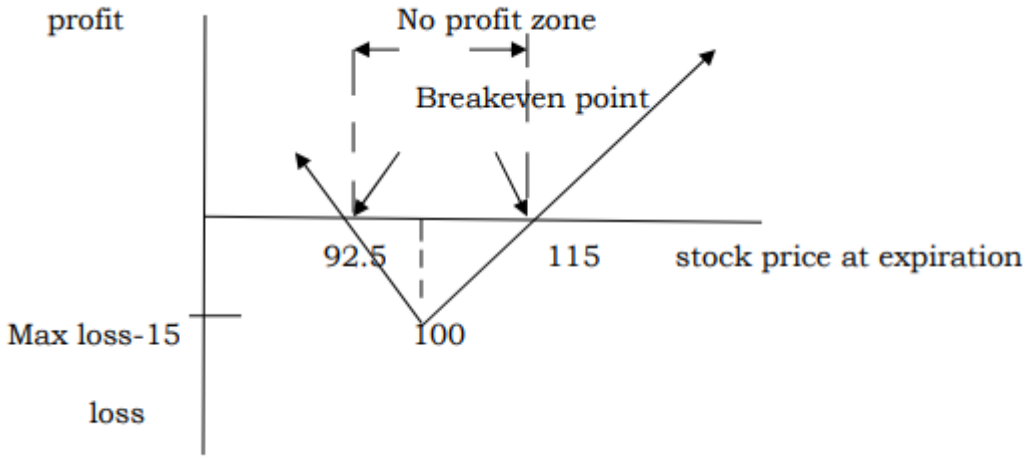
Upper breakeven point= strike price of calls/puts+ net premium paid

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 case of an upward move, only one call option generates profit.

The pay-off position of strip 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.

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* - combination of options having different strike prices but the same maturity.

2. *Horizontal spread* – option position in similar options having different expiration dates but with the same strike prices.

3. *Diagonal spread* – taking positions in options of the same type with different strike prices and different maturities.

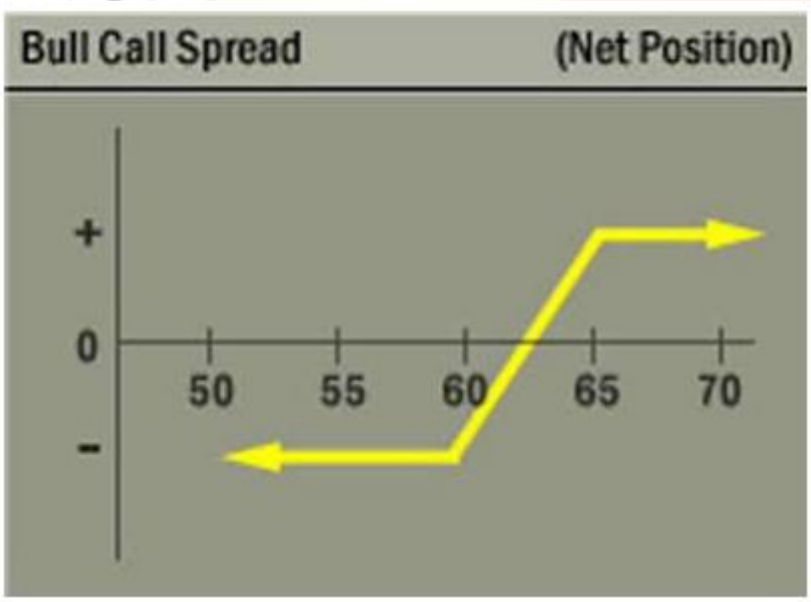
Spread strategies can be evolved for bearish conditions and bullish conditions. Accordingly, spread can be classified into bull spreads and bear spreads.

1. Bull spread
2. Bear spread
3. Butterfly spread
4. Condor spread
5. Calendar spread
6. Box spread
7. Ratio spread

BULL SPREAD

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

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.

Bear Call Spread Construction

Buy 1 ATM Call

Sell 1 OTM Call

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 ATM 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.

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-the-money 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.

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.

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.

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 under-priced in relation to their expiration values.

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 ofexotic 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 American 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 favourable 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 5

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.
6) Vehicles for meeting the financial needs of MNCs.

The disadvantages of swaps are:

1) Early termination of swap before maturity may incur a breakage cost. Termination requires mutual consent of both the parties.
2) Lack of liquidity (not easily tradable)
3) It is subject to default risk
4) Difficult to find a counter party with opposite cash flow obligation who could enter for a swap deal.

Uses of Swaps

Swaps are very useful derivatives. It has variety of uses to different people.

1. Uses to treasurers: Treasurers can use swaps to hedge against rising interest rates and to reduce borrowing costs.

2. Uses to financial managers: Swaps give financial managers the ability to: (a) convert floating rate debt to fixed rate or fixed rate to floating rate (b) to lock in an attractive interest rate in advance of a future debt issue (c) position fixed rate liabilities in anticipation of a decline in interest rates (d) arbitrage debt price differentials in the capital markets

3. Uses to financial institutions,etc.: Financial institutions, pension managers and insurers use swaps to balance asset and liability positions without leveraging up the balance sheet and to lock in higher investment returns for a given risk level.

FEATURES OF SWAPS

1. It is a combination of forwards. So it has all the properties of forward contracts
2. Two parties with equal and opposite needs must come into contact with each other.
3. Customised, tailor-made and OTC derivatives
4. It is in the nature of long-term agreement. It is just like long dated forward contract.
5. Arranged mostly through an intermediary. This intermediary is known as swap **facilitator.** Usually intermediaries will be large international financial institutions or banks.
6. Most of swap deals are bilateral agreements. Therefore, there is a problem of potential default by either of the counter-party. This makes swaps more risky.
7. Swaps do not involve an upfront payment. Thus, they have a zero value at the start.

TERMS USED IN SWAP CONTRACT

1. Parties: Generally, there are two parties in a swap deal. Intermediaries are excluded. For example, in an interest rate swap, the first party can be a fixed rate payer / receiver and the second party can be a floating rate receiver / payer. The parties to the swap contract are known as counter-parties.

2. Swap facilitators: A swap facilitator is a mediator who assists in formation and completion of a swap arrangement between the interested parties. A swap facilitator is generally a bank. There are two kinds of swap facilitators - Swap broker and swap dealer.

(a) *Swap broker*: A swap broker is an intermediary. He is an economic agent. He helps in identifying the potential counter parties in a swap deal. He acts only as a facilitator. He does not take any individual position in the swap contract. He will charge commission for his services.

(b) *Swap dealer:* A swap dealer associates himself with the swap deal. He often becomes an actual party to the transaction. He may be actively involved as a financial intermediary for earning a profit. He is also known as market maker.

3. Notional Principal: Notional principal is the underlying amount in a swap contract. This underlying amount becomes the basis for the deal between counterparties. It is called "notional" because this amount does not vary, but the cash flows in the swap are attached to this amount. For example, in an interest rate swap, the interest is calculated on the notional principal.

4. Trade date: Trade date is the dates on which both the parties in a swap deal enter into the contract.

5. Effective date: This is the date when the initial cash flows in a swap contract begin. The maturity of swap contract is calculated from this date. Effective date is also known as value date.

6. Reset Date: This is the date on which the LIBOR rate is determined. The first next date will be generally two days before the second payment date and so on.

7. Maturity date: This is the date on which the outstanding cash flows stop in the swap contract.

Economic Functions of Swap Transactions

1. Transforming the nature of liabilities
2. Transforming the nature of assets
3. Hedging
4. Reducing the cost of funds.

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 currency exchange. 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.

Forms or Types of Currency Swaps

1. **Fixed-for-floating currency swap:** This is the normal form of swap. In this case one counter party pays fixed rate of interest and the other floating rate of interest.
2. **Fixed for fixed currency swap:** In this case both counterparties are paying fixed rate of interest. It is adopted when one counter party possesses an advantageous position while borrowing a particular currency.
3. **Floating for floating currency swap**: In this case both the counter parties pay floating rates of interest.
4. **Amortising swap:** In this case principal amounts amortise over the life of the swap.
5. **Basis swaps:** These involve an exchange of floating rate payments calculated on different basis.

   The other form of swaps are participation swaps, zero-coupon swaps, commodity swaps etc.

Advantages of Currency Swaps

1. Currency swaps can be used to hedge against foreign exchange risk.
2. It increases the total amount that a firm can borrow. This facilitates economies of scale. This reduces operating costs.
3. A firm can use its surplus funds more effectively in blocked currencies.
4. It can be used as a means of exploiting the opportunity for arbitrage.
5. It plays an important role in integrating the world's capital markets by overcoming barriers to international capital movements.

2. 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.

Advantages of Interest Rate Swaps

Swaps are essentially a derivative used for hedging and risk management. The advantages of interest rate swaps are summarized as below:

1. It does not involve any exchange of principal amounts. It consists only of an to exchange interest flows: Therefore risk is less.

2. The documentation charge is minimum agreement

3. It is not contingent liability because the risk is unquantifiable. Hence it need not be shown as a foot-note. It means it is an off balance sheet item.

4 Interest rate swap can be used both in asset and liability management to allow for flexibility. It can also be used for hedging and for increasing profitability.

5. Swapping fixed to fixed rate may save the issuer's money if interest rates decline.

6. By swapping, a borrower can raise funds at a fixed rate when interest rates are rising and then switch to floating rates in case they are falling.

DIFFERENCE BETWEEN CURRENCY SWAPS AND INTEREST SWAP

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

3. 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

4. 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).

5. 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

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, standardized 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, and their structure is 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
2. Range accrual swaps
3. Digital swap
4. Chooser swap
5. Bermudan swaps.
6. Asian swaps
7. Barrier swap
8. Corridor swap