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FINANCIAL DERIVATIVES



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SYLLABUS

Unit – I Introduction to Derivatives –Definition of Financial Derivative –Features- Types of Financial Derivatives – History of Derivatives Markets – Uses of Derivatives – Critiques of Derivatives – Forward Market– Forward Contract concept – Features of Forward Contract – Classification of Forward Contracts – Forward Trading Mechanism – Forward Prices Vs Future Prices.

Unit – II Options and Swaps – Concept of Options – Types of options – Option Valuation – Option Positions Naked and Covered Option – Underlying Assets in Exchange-traded Options – Determinants of Option Prices – Binomial Option Pricing Model – Black-Scholes Option Pricing – Basic Principles of Option Trading – SWAP: Concept, Evaluation and Features of Swap – Types of Financial Swaps – Interest Rate Swaps – Currency Swap – Debt Equity Swap.

Unit – III Futures – Financial Futures Contracts – Types of Financial Futures Contract – Evolution of Futures Market in India – Traders in Futures Market in India – Functions and Growth of Futures Markets Theories of Future prices – Future prices and Risk Aversion – Forward Contract Vs. Futures Contracts.

Unit – IV Hedging and Stock Index Futures – Concepts – Perfect Hedging Model – Basic Long and Short Hedges – Cross Hedging –Hedging Objectives – Management of Hedge – Concept of Stock Index – Stock Index Futures – Stock Index Futures as a Portfolio management Tool – Speculation and Stock Index Futures – Stock Index Futures Trading in Indian Stock Market.

Unit – V Financial Derivatives Market in India – Need for Derivatives – Evolution of Derivatives in India – Major Recommendations of Dr. L.C. Gupta Committee – Derivatives Trading at NSE/BSE – Eligibility of Stocks – Emerging Structure of Derivatives Markets in India – Foreign Exchange Management

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INDEX

UNIT	TITLE	PAGE NUMBER
I	INTRODUCTION TO DERIVATIVES	5-25
II	OPTIONS AND SWAPS	26-50
III	FUTURES	51-69
IV	HEDGING AND STOCK INDEX FUTURES	70-90
V	FINANCIAL DERIVATIVES MARKET IN INDIA	91-111



UNIT 1

INTRODUCTION TO DERIVATIVES

DERIVATIVES

MEANING

The term Derivative indicates that it has no independent value and its value is entirely derived from the value of the underlying assets. In other words, the value is derived from an existing product. In mathematics a derivative it is a variable derived from an existing variable. In financial terms a derivative is a product whose value is derived from the value of an existing product. Thus, for derivative to exist, there should be an underlying product and there should be a market for the underlying. In other words, a derivative is a financial product, which has been derived from another financial product or commodity. The derivatives do not have independent existence without the underlying product and market.

Derivatives are so called because they are financial instruments whose value is derived from the value of an underlying financial instrument (a treasury bill, a bond or a note) or an individual equity or an equity index or an interest rate or a commodity (e.g. gold) or credit risk. The primitive and simplest form of derivatives is the forward contract (also known as the forefather of the derivatives). We have financial derivatives, commodity derivatives, interest rate options and swaps, credit derivatives etc.

The Oxford dictionary defines a derivative as something derived or obtained from another, coming from a source; not original. In the field of finance, a derivative security is generally referred to a financial contract whose value is derived from the value of an underlying asset or simply underlying.



The term Derivative has been defined in Securities Contracts (Regulations) Act, as:

- (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;
- (b) a contract which derives its value from the prices, or index of prices, of underlying securities.

The following are the main features of derivatives:

- 1. Contract:** Derivative is a contract. There must be a binding contract between the parties and the same is to be fulfilled in future. At least two parties are involved in a derivative contract. Both these parties are legally bound to follow the contract for a predefined period which may be short or long. A party can sue other party for breach of the contract.
- 2. No independent value** Generally derivatives derives its value is from the value of the underlying asset such as gold, silver, wheat, rice etc.. If the value of underlying asset increases, it will lead to increase in the value of option and vice versa.
- 3. Predefined fixed duration** Derivative means a forward, future option or any other hybrid contract of a fixed duration. A valid contract always has a predefined period and when this period expires, it will lead to the expiry of the contract as well. A hedger, speculator or arbitrageur cannot enter into an indefinite contract. For example, in the above discussed case, if the person does not exercise its option within three months, then his right to exercise the option will get expired.
- 4. Linked to the value** of a specified real or financial asset or to an index of securities. The value of the derivative is linked to the value of underlying asset.



5. **Financial products** Derivatives are financial products and its value is derived from another financial asset.
6. **Minimal initial investment** derivatives may require very low or no initial investment as there is no investment in actual asset or liability.
7. **Cost effective protection** it provides cost effective protection to investors against different types of risk associated with the fluctuations in the market with respect to exchange rates, interest rates etc.
8. **Enhancing liquidity** Derivatives can enhance liquidity by improving the credibility of the investors dealing in these derivatives. Sometimes banks offer finance to only those companies who have reduced their market risk by hedging etc.
9. **Allows product innovation** Derivatives allows fast product innovation as the changes can be made quickly and new contracts can be introduced quickly.

TYPES OF DERIVATIVES

The types of derivatives depend on the type of underlying assets. The following are the different types of derivatives, based on the underlying assets:-

1. **Commodity Derivatives:** In commodity derivatives the underlying asset is a commodity. It can be agricultural commodity like wheat, Rice, Cotton, Pepper etc or precious metals like gold, silver etc.
2. **Financial Derivatives:** Derivatives in currencies, gilt-edged securities, shares ,share indices etc. are known as financial derivatives. These are transacted at different exchanges all over the world. Financial derivatives can be broadly classified into the following types:-
 - a. **Currency Derivatives:** Currency derivatives are future contracts between buyers and sellers that involves the exchange of two currencies at a future date at a pre defined rate. It helps to reduce the foreign exchange rate risk.



- b. Interest rate derivatives:** Interest rate derivative (IRD) is a derivative with a value that is linked to the movements of an interest rate or rates. In this case the underlying product is an interest rate.
- c. Stock and Stock Index derivatives etc:** These are future contracts between buyers and sellers that involve the exchange of stocks and stock indices at a future date at a pre-defined rate.
- 3.Credit Derivatives:** Credit derivative is an arrangement by which one party transfers a credit risk of an underlying asset to one other party or parties. The party which transfers such credit risk is known as protection buyer and the party which absorbs the credit risk is known as protection seller. Such derivatives help in separating the credit risk from the total risk and allow the separate trading of the former.
- 4.Basic derivatives:** Basic derivatives are the derivatives on underlying assets. Futures and Options are two basic derivatives
- 5.Complex Derivatives:** Swaps, Interest rate futures are complex derivatives.
- 6.Exchange Traded Derivatives:** Exchange Traded Derivatives are standard contracts traded as per the rules and regulations of the exchange. At present all the derivative exchanges are online computerized exchanges. These exchanges are subject to margins and strict surveillance by the exchange authorities. Only members are allowed to trade..All the contracts are guaranteed against counter party default.In this case credit risk is reduced to the minimum
- 7.OTC Derivatives:** All OTC Derivatives are private contracts between the parties under the law of contracts. They are all regulated by the statutory provisions..The OTC derivatives carry higher risk of default by any of the parties. All forward contracts are OTC derivatives.



History of Derivatives

Derivatives may have found their way into the media in very recent times. However, they have been used by mankind for a very long time. Since the inception of time, humans have not liked the idea of uncertainty. More so, they did not like the idea of economic uncertainty. Hence, the need to offset this uncertainty gave rise to the evolution of contracts. Earlier contracts were verbal agreements and were not as sophisticated as the ones today. However, they were contracts nonetheless. In this article, we will trace the evolution of derivatives throughout the ages. Derivatives are said to have existed even in cultures as ancient as Mesopotamia. It was said that the king had passed a decree that if there was insufficient rain and therefore insufficient crop, the lenders would have to forego their debts to the farmers. They would simply have to write it off. Thus, the farmers had just been given a put option by the king. If certain events unfolded in a certain way they had the right to simply walk out of their liabilities.

There have been many such examples that have been quoted during the time. Another famous example pertains to Greek civilization when one of Aristotle's followers who were adept at studying meteorology predicted that there would be a bumper crop of olives that year. He was so sure that he went ahead and purchased the produce of all the Olive farms in and around Athens before the crop had been harvested. In the end it did turn out to be a bumper crop and Aristotle's disciple made a huge profit from his way ahead of time forwards contract.

19th Century: Chicago Board Of Trade

During the nineteenth century, America was at its pinnacle of economic progress. America was the center of innovation. One such innovation came in the



field of exchange traded derivatives when farmers realized that finding buyers for the commodities had become a problem. They created a joint market called the “Chicago Board of Trade”. A few years later, this market evolved into the first ever derivatives market. Instead of buyers and sellers negotiating their own customized contracts, there were now standard contracts listed on the exchange which could be bought and sold by anyone. This idea proved to be a big hit. Soon Chicago Board of Trade had to create a spinoff called Chicago Mercantile Exchange to handle the growing business. Recently Chicago Board of Trade and Chicago Mercantile Exchange have been merged to form the CME group. It is still one of the foremost derivatives markets in the world. The massive success witnessed by the members of the Chicago Board of Trade led to the creation of many such exchanges across the globe. However, during the era of Chicago Board of Trade, derivatives’ trading was limited to commodities only. Other financial instruments were largely outside the realm of such trading.

Modern Day

Innovations in the modern financial market have largely been based on the idea of derivatives. What started as a simple idea in ancient times was later developed into standard contracts during the Chicago Board of Trade era has now become a maze of complex financial instruments and contracts. The asset classes on which the derivative instruments were based have undergone a rapid expansion. Nowadays, there is a derivative for pretty much everything. The reason behind this rapid expansion is that derivatives meet the needs of a large number of individuals and businesses worldwide. After the collapse of 2008, derivatives had to take the fall for the entire chain of events. They were vilified by the media in general. That has come as somewhat of a setback. Barring that the rise of derivatives in the recent years has been nothing short of extraordinary and this is expected to continue in the future.



ECONOMIC BENEFITS OF DERIVATIVES

The following are the major economic benefits of derivatives.

- (i) **Risk management:** Derivatives help in managing risks in an efficient manner. It helps to control, avoid, shift and manage efficiently different types of risks through various strategies like hedging, arbitraging, spreading etc. Derivatives help the investors to shift or modify the risk characteristics of their portfolios suitably..
- (ii) **Helps in smoothening of price fluctuations:** Derivatives trading in the market helps to smoothen out price fluctuations at different points of time. It helps to remove shortage in the markets.
- (iii) **Price discovery:** Derivatives serve as a barometer of future trends in prices, which result in the discovery of new prices both on the spot and future markets .It helps in disseminating information regarding future markets, trading of different commodities and securities, which enable to form correct equilibrium prices in the markets.
- (iv) **Transactional efficiency and enhanced liquidity:** Since most of the derivatives trading are based on margin trading, full amount of the transaction is not required immediately. Thus derivative trading reduces transaction costs and enhances liquidity in the markets for underlying assets.
- (v) **Helps in proper asset allocation:** The derivatives assist the investors traders etc of large pools of funds to devise proper strategies for asset allocation which leads to high yields and achievement of investment objectives
- (vi) **Attract young investors, professionals etc.:** Derivatives trading attracts young investors, professionals and other experts who will act as catalysts to the growth of financial markets

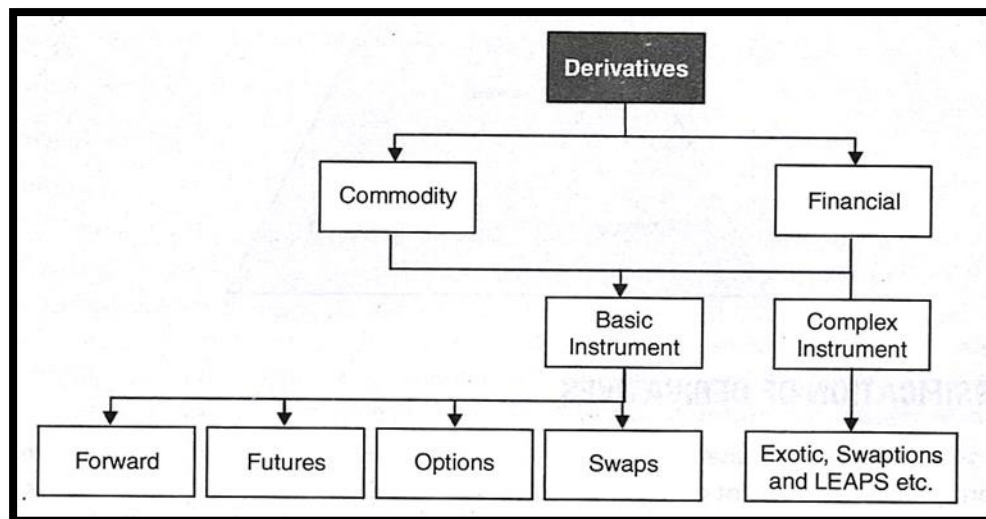


CLASSIFICATION OF DERIVATIVES

Derivatives can be classified in to two categories:

1. Commodity Derivatives and
2. Financial Derivatives

Figure 1: Classification of Derivatives



COMMODITY DERIVATIVES:

Commodity derivatives are investment tools that allow investors to make profit from certain commodities without possessing them. In commodity derivatives, the buyer of a derivative contract buys the right to exchange a commodity for a certain price at a future date. In commodity derivatives the underlying asset is a commodity. It can be agricultural commodity like wheat, Rice, Cotton, Pepper etc or precious metals like gold, silver etc. which are heterogeneous, durable, and gradable.



There must be frequent fluctuations in the prices of the commodity and the supply of the commodity should be open and free and should not be monopolized. Commodity derivatives include futures, forwards, options, swaps etc.

FINANCIAL DERIVATIVES:

Financial Derivatives denote a variety of financial instruments including stocks, bonds, treasury bills, gilt edged securities, foreign currencies and other hybrid securities. These are transacted at different exchanges all over the country. Financial derivatives may be currency derivatives, interest rate derivatives, stock derivatives, stock index derivatives etc. Financial derivatives include futures, forwards, options, swaps etc.

FORWARDS

It is a bilateral agreement between two counter parties where one party agrees to sell and the other party agrees to buy the commodity, foreign exchange etc. at an agreed price decided today but to be delivered at some future period of time. These contracts are undertaken by the parties to protect themselves from future uncertainty. In this one party takes Long position (one who agrees to buy the product, currency etc) and the other party takes short position (one who agrees to sell that product) and executes the contract at some specified future period of time. Both the parties are legally bound to execute the contract. But the risk of default always remains there. It is possible that either of the party defaults. Thus they are used by people with good reputation.

Forward contract is a contract for delivering goods. It is also known as a specific delivery contract. Forward transactions are settled in future but at a fixed date.



The specific delivery contracts are of two types :

- (i) Transferable Specific Delivery Contracts in which rights and liabilities mentioned in contracts are transferable.
- (ii) Non-Transferable Specific Delivery Contract (NTSDC) in which rights and liabilities are not transferable.

Forward Trading mechanism

The two parties typically enter into a forward contract because of their opposing views on a particular asset's future price. One party believes that the price of a particular asset is set to rise in the future and therefore wishes to purchase it at a lower, predetermined price to make profits based on the price difference. Hence, this party offers to be the buyer. On the other hand, the other party believes that the asset's price will fall in the near future and therefore wishes to cut their losses by locking in a predetermined price. This party, therefore, offers to be the seller. Based on how the market performs and the price of the asset changes, the actual result of the forward contract can typically go in three different ways:

1. The Price of the Asset Rises In The Future

In this scenario, the buyer's prediction comes true, and they can sell the asset at a higher price. They take the delivery of the asset by paying the lower predetermined price of the forwards' contract and sell it on the open market. The profit made by the buyer in this scenario is the difference between the actual current price of the asset and the locked-in price at which the buyer bought it.



2. The Price of the Asset Falls in The Future

In this scenario, the seller's prediction is correct, providing benefits from the sale made through the forward contract. Even though the price of the asset has fallen, the seller gets to sell it at a price higher than its current value. The profit made by the seller in this scenario is the difference between the price at which the seller sells the asset and the actual current price of the asset.

3. The Price of The Asset Remains Unchanged In The Future

In this scenario, the prediction of neither the buyer nor the seller is proven correct. Therefore, the transaction results in no profit made or loss incurred by either party.

Example of a Forwards Contract

To understand the concept better, let us take a forward contract example. Let's say a farmer is on track to harvest 20 tonnes of maize by next year. To make a profit on his harvest, he must sell it at a price of at least Rs 10,000 per tonne. If the farmer chooses to wait till next year to sell his maize harvest, he may or may not be able to make a profit on the transaction. This is because there is no saying what the price per tonne will be next year.

However, if the farmer chooses to enter into a forward contract with a food manufacturing company that guarantees to pay him his desired price in exchange for his harvest next year, his risk is minimised. Therefore, even if the price of maize falls next year, he will be protected by the obligation of the forward contract and the fact that he will receive a higher price based on the lock-n price.



Features of a Forwards Contract

- Unlike futures contracts, forwards contracts are not standardised and are not traded on exchanges. As a result, they are also more customisable and allow for specific changes in the agreements with regards to the asset traded, amount and date of delivery.
- The parties can settle forward derivatives in one of the two ways. One is where the seller makes physical delivery of the assets and receives the agreed-upon payment by the buyer. The other is where cash settlement occurs, and there is no actual physical delivery of the asset in question. Instead, one of the two parties settles the contract by paying the other an appropriate differential in cash.
- Forward contracts are some of the most commonly employed tools for corporations to minimise and hedge interest rate related risks. By entering into a forwards contract, they won't have to purchase an asset at a higher price in the future.
- Forward trading typically requires no margin amount and is unregulated by the Securities and Exchange Board of India, i.e. SEBI, making it customisable and easier to trade.
- A forward contract does not trade on any centralized exchange. It is also not regulated by a third-party authority.
- Forward contracts are bilateral hence are prone to counterparty risks.
- A forward contract is a tailor-made contract, with the terms and conditions that both the parties agree.
- It contains details like the expiration date, asset type, and quantity, etc.
- Generally, the general public is not aware of the price of a futures contract.
- The contract price is not available in the public domain.



Classification of Forward Contracts

The forward contracts can be classified into different categories. Under the Forward Contracts (Regulation) Act, 1952, forward contracts can be classified in the following categories:

1. Hedge Contracts

The basic features of such forward contracts are that they are freely transferable and do not specify any particular lot, consignment or variety of delivery of the underlying goods or assets. Delivery in such contracts is necessary except in a residual or optional sense. These contracts are governed under the provisions of the Forward Contracts (Regulation) Act, 1952.

2. Transferable Specific Delivery (TSD) Contracts:

These forward contracts are freely transferable from one party to other party these are concerned with a specific and predetermined consignment or variety of the commodity. There must be delivery of the underlying asset at the expiration time, It is mandatory. Such contracts are subject to the regulatory provisions of the Forward Contracts (Regulation) Act, 1952, but the Central Government has the power to exempt (in specified cases) such forward contracts.

3. Non-Transferable Specific Delivery (NTSD) Contracts

These contracts are of such nature which cannot be transferred at all. These may concern with specific variety or consignment of goods or their terms may be highly specific. The delivery in these contracts is mandatory at the time of expiration. Normally, these contracts have been exempted from the regulatory provisions of Forward Act, but the Central Government, whenever feels necessary, may bring



them under the regulation of the Act, It is evident from the above that the definition of hedge contracts corresponds to the definition of futures contracts while the latter two are not futures contracts, and hence, termed as forward contracts, Since in both hedge contracts and futures contracts, no specification about the underlying asset / commodity is mentioned because such limits are set by the rules of the exchange on which types can or cannot be delivered. If the variety is superior or inferior to the basis variety for delivery, in that case the prices are adjusted by means of premium or discount as the case may be. Such adjustments are popularly known as tendering differences. Thus, on this basis. in maybe generalized that every futures contract is a forward contract but every forward contract may not be futures contract.

Advantages of a Forward Contract

The following are the advantages of a forward contract:

- Highly customized.
- Great way to hedge against the fluctuations of the market.
- Lowers international trade-related risks.
- No upfront costs for hedging.

Risks or Limitations of a Forward Contract

- Very little public information about the market cap due to lack of regularization.
- Prone to counterparty risks such as non-payment due to defaults.
- In a highly volatile market, forward contracts may hurt a company that miscalculated the movement of the prices.



The Determination of Forward Prices

Forward contracts are generally easier to analyze than future contracts because in forward contracts there is no daily settlement and only a single payment is made at maturity. Though both futures and forward prices are closely related, this will be described in the latter part of this chapter, it is essential to know about certain terms before going to determine the forward prices such as distinction between investment assets and consumption assets, compounding, short selling, repo rate and so on because these will be frequently used in such computation. We are not discussing these here in detail but the traders must be aware about them thoroughly. A brief view of these terms is explained here as under:

Consumption assets are those assets which are held primarily for consumption, and not usually for investment purposes. There are commodities like copper, oil, food grains and live hogs. Compounding is a quantitative tool which is used to know the lump-sum value of the proceeds received in a particular period, consider an amount A invested for n years at an interest rate of R per annum. If the rate is compounded once per annum, the terminal value of that investment will be

Terminal value = $A(1 + R)^n$ and if it is compounded m times per annum then the terminal value will be $A(1 + R/m)^{mn}$

Where A is amount for investment R is rate of return, N is period for return and m is period of compounding.

FUTURES

One of the important functions of financial market is to manage risk. Every business transaction, in order to be complete, takes time. If during this time prices change, a profitable deal may turn out to be unprofitable one. Thus, every person is exposed to some kind of risk due to price fluctuations.

It is here, that future markets play an important role by providing protection



against the risks inherent in business world due to price fluctuations. The tool used to obtain this protection is a future contract i.e. an agreement to buy or sell an asset in the future at a certain price.

Types of Future Contracts

Future contracts can be divided broadly into two categories:

1. **Commodity Futures:** Under commodity futures the commodity is exchanged for cash in the spot market at the previously determined price. The transaction takes place in the commodity market. Volatility in price with time is hedged.
2. **Financial Futures.** Financial futures are further divided into three categories as
 - (a) Interest Rate Future
 - (b) Stock-Index Futures
 - (c) Currency Futures

OPTIONS

An option is a contract conveying the right but not the obligation to buy or sell specified financial instruments at a fixed price before or at a certain future date. There are two parties in options in which the buyer receives a right for which he pays a fee called premium and the seller undertakes an obligation. Buyer of the option pays the premium to the option writer (seller) to compensate him for renouncing his right and incurring his obligation. The premium is the price fixed and negotiated when the option is bought or sold. The buyer has every discretion to exercise his option in future.

There are two components of options i.e. Call Option and Put Option.

(a) Call Option

The owner/buyer has the right to purchase and the writer/seller has the obligation to sell specified number of securities of the underlying stocks at a specified price prior to the option expiry date.



(b) Put Option

The owner or buyer has the right to sell and the writer/seller has the obligation to buy specified number of the underlying shares at a specified price prior to the expiry date of option.

SWAPS

Swap is the exchange of cash flows or a set of financial obligation between two parties over time. Swaps involve agreement between two parties for a specified period of time. A party can cancel the agreement before the end of the term by paying a final difference to the other party. Swaps have become one of the popular financial derivatives with the deregulation and increasing volatility of interest and exchange rates. Firms use swaps to tap the international financial markets.

TYPES OF SWAPS

Swaps may be of the following three types.

1. Interest rate swaps.
2. Currency swaps.
3. A combination of these.

USES OF DERIVATIVES

Today's sophisticated international markets have helped foster the rapid growth in derivative instruments. In the hands of knowledgeable investors, derivatives can derive profit from:

- Changes in interest rates and equity markets around the world
- Currency exchange rate shifts
- Changes in global supply and demand for commodities such as agricultural products, precious and industrial metals, and energy products such as oil and natural gas



Adding some of the wide variety of derivative instruments available to a traditional portfolio of investments can provide global diversification in financial instruments and currencies, help hedge against inflation and deflation, and generate returns that are not correlated with more traditional investments. The two most widely recognized benefits attributed to derivative instruments are **price discovery** and **risk management**.

1. Price Discovery

Futures market prices depend on a continuous flow of information from around the world and require a high degree of transparency. A broad range of factors (climatic conditions, political situations, debt default, refugee displacement, land reclamation and environmental health, for example) impact supply and demand of assets (commodities in particular) and thus the current and future prices of the underlying asset on which the derivative contract is based. This kind of information and the way people absorb it constantly changes the price of a commodity. This process is known as price discovery.

- With some futures markets, the underlying assets can be geographically dispersed, having many spot (or current) prices in existence. The price of the contract with the shortest time to expiration often serves as a proxy for the underlying asset.
- Second, the price of all future contracts serves as prices that can be accepted by those who trade the contracts in lieu of facing the risk of uncertain future prices.
- Options also aid in price discovery, not in absolute price terms, but in the way the market participants view the volatility of the markets. This is because options are a different form of hedging in that they protect investors against losses while allowing them to participate in the asset's gains.

2. Risk Management

This could be the most important purpose of the derivatives market. Risk management is the process of identifying the desired level of risk, identifying the actual level of risk and



altering the latter to equal the former. This process can fall into the categories of hedging and speculation. Hedging has traditionally been defined as a strategy for reducing the risk in holding a market position while speculation referred to taking a position in the way the markets will move. Today, hedging and speculation strategies, along with derivatives, are useful tools or techniques that enable companies to more effectively manage risk.

3. They Improve Market Efficiency for the Underlying Asset

For example, investors who want exposure to the S&P 500 can buy an S&P 500 stock index fund or replicate the fund by buying S&P 500 futures and investing in risk-free bonds. Either of these methods will give them exposure to the index without the expense of purchasing all the underlying assets in the S&P 500.

If the cost of implementing these two strategies is the same, investors will be neutral as to which they choose. If there is a discrepancy between the prices, investors will sell the richer asset and buy the cheaper one until prices reach equilibrium. In this context, derivatives create market efficiency.

4. Derivatives Also Help Reduce Market Transaction Costs

Because derivatives are a form of insurance or risk management, the cost of trading in them has to be low or investors will not find it economically sound to purchase such "insurance" for their positions

ADVANTAGES OF DERIVATIVES

1. They help in transferring risks from risk adverse people to risk oriented people.
2. They help in the discovery of future as well as current prices.
3. They catalyze entrepreneurial activity.
4. They increase the volume traded in markets because of participation of risk adverse people in greater numbers.
5. They increase savings and investment in the long run.



LIMITATIONS OF DERIVATIVES

- (i) **Promote Speculative and Gambling motives:** One of the most important limitation of derivatives is that they promote speculative activities and gambling motive in the market.
- (ii) **High Risk:** Even though derivatives help to manage risks to a certain extent, it has been observed that they are highly risky, especially the OTC market
- (iii) **Price fluctuations:** Derivatives have caused wide and wild fluctuations in asset prices. They have widened the range of such fluctuations in the prices.
- (iv) **Burden on Government and regulatory authorities:** Derivatives create instability in the financial system and as such there will be more burden on the government and various regulatory authorities to control the activities of the traders in financial derivatives.

Forward Prices Versus Futures Prices

Whether the forward prices are equal to futures prices, this is very important and debatable issue. It is argued that if risk free interest rate is constant and the same for all maturities, in such market situations, forward price will be same as the futures price of the contract. However, in actual practice, the interest rates do not remain constant and usually vary unpredictably, then forward prices and futures prices no longer remain the same- We can get sense of the nature of the relationship by considering the situation where the price of the underlying asset is strongly positively correlated with interest rates, Since to futures contracts, there is daily settlement, so if current price(s) increases, an investor who holds long future position, makes an immediate profit, which will be reinvested at a higher than average rate of interest. Similarly, when current price(s) decreases, the investor will incur immediate loss, and this loss will be financed at a lower-



than-average rate of interest. However, this position does not arise in the forward contract because there is no daily settlement and interest rate movements will not have any affect till maturity. It is further argued that when spot (current) prices are strongly positively correlated with the interest rates, futures prices will tend to higher than the forward prices, similarly, if spot prices are strongly negatively correlated with the interest rates, then forward prices will tend to higher than the futures prices. It is further observed that though there may be theoretical difference between forward prices and futures prices due to various factors like taxes, transaction costs, treatment of margin and default risk, but this difference is very small which may be ignored.



UNIT II

OPTIONS AND SWAPS

An option is a contract conveying the right but not the obligation to buy or sell specified financial instruments at a fixed price before or at a certain future date. There are two parties in options in which the buyer receives a right for which he pays a fee called premium and the seller undertakes an obligation. Buyer of the option pays the premium to the option writer (seller) to compensate him for renouncing his right and incurring his obligation. The premium is the price fixed and negotiated when the option is bought or sold. A person who buys the option is said to be long in the option and the other who sells is said to be short.

There are two components of options i.e. Call Option and Put Option.

Call Option

A person who purchases the right to purchase a specified number of securities of the underlying stocks at a specified price prior to the option expiry date.

Put Option

A person who purchases the right to sell a specified number of securities of the underlying stocks at a specified price prior to the option expiry date.

TYPES OF OPTIONS

Options have several features, certainly more than forwards and futures making several differentiations possible in the basis products of calls and puts. Based on several considerations the options can be categorized in a number of ways. Such as:

- Based on nature of exercise of options
- Based on nature of exercise of options
- Based on how are they generated, traded, and settled
- Based on the underlying asset on which options are created



Nature of Exercise: American Versus European

Based on the timing of exercise the options can be either American or European. American options can be exercised at any point of time before the expiry date of the option, while European options are exercisable only upon maturity,

Nature of Markets: OTC versus Exchange Traded

Options can also be categorized as OTC or exchange traded depending upon where and how they are created, traded, and settled. Options may be like forward contracts, which are specific and negotiated by two contracting parties mutually with direct negotiations, known as OTC, or they can be like futures which may be bought and sold on the specific exchanges where the two contracting parties may not be known to each other but instead enter into a contract on the floor/screen of an exchange. In the exchange traded options, the contracts need to be standardized, while an OTC product is tailor-made to the requirements of the parties concerned. The standardization of option contracts would be in the discretion of the exchange and is done in terms of Quantity of Underlying Asset. Only specific quantities of the underlying asset could be traded on the exchange and need to be predetermined.

Ways of Settlement

Options can be settled either by delivery of underlying asset or by cash settlement, which is closing out by exchanging the differential of price at initiation and closing out. Cash settlement at the expiry is done by exchanging the difference between the exercise price and price of the underlying asset. It can also be settled by the cancellation of the contract by entering into an equal and opposite contract to the original one.



Nature of Underlying Assets

Like forwards and futures, options too can have any asset as underlying. Options on stocks, indices, commodities, currencies, and interest rates are available either OTC or on exchanges. Though not available in India as of now, options on commodities are traded internationally on agricultural products, livestock, food products, energy, and metals. Options are also available on various currencies, such as US dollar, Euro, Yen, Pound, etc. In major exchanges in the USA and Europe as also other parts of the world. Options on currencies are mostly OTC.

Besides, options are also traded on the exchanges on futures contracts rates, Options on futures have futures contract as underlying asset, which give the buyer a right to buy(call) or sell (put) the specified futures contract within or at specified time. Naturally, the expiry of the futures contract must extend beyond that of option contract. Similarly, options can also be traded on interest rates, either on cash asset such as treasury bonds and notes, or on interest rate futures contracts. These options serve the same purposes as do the options on stocks and indices.

Options on stocks and stock indices are most common. Several exchanges across the world offer options on indices and stock, National Stock Exchange (NSE) in India offers options on several indices such as Nifty, a broad-based index of 50 stocks from banking, information technology, infrastructure, etc.

Presently these options cover limited exercise prices and cover periods up to three months. However, internationally options for longer periods of up to two to three years are also available. NSE attempts to provide minimum five strike prices – two ITM, one ATM, and two OTM at any point of time).



Naked (Uncovered) and Covered Option

Naked or uncovered options are those which do not have offsetting positions, and therefore, are riskier. On the other hand, where the writer has corresponding offsetting position in the asset underlying the option is called covered option. Writing a simple uncovered (or naked) call option indicates toward exposure of the option writer to unlimited potential losses. The basic aim is to earn the premium. In period of stable or declining prices, call option writing may result in attractive Profits by capturing the time value of an option. The strategy of writing uncovered calls reflects an investor's expectations and tolerance for risk.

A covered option position involves the purchase or sale of an option in combination with an offsetting (or opposite) position in the asset which underlies the option. As observed earlier, the writer of the call option incurs losses when stock prices rise, and put writers incur losses when prices fall. In such situation, the writer can cover the short put with a short position and short call with a long position in the underlying asset. This can be stated as:

Covered call sale = Short call + Long futures
Covered put sale = Short put + Short futures

Various assets, which are actively traded on the recognized exchanges, are stocks, stock indices, foreign currencies and futures contracts. These have been explained in brief here as under;

Stock Options

Options on individual shares of common stock have been traded for many years. Trading on standardized call options on equity shares started in 1973 on CBOE whereas on put options began in 1977. Stock options on a number of over-the-count



stocks are also available, while strike prices are not because of cash dividends paid to common stock holders, the strike price is adjusted for stock splits, stock dividends reorganization, recapitalizations, etc. which affect the value of the underlying stock. Stock options are most popular assets, which are traded on various exchanges all over the world. For example, more than 500 stocks are traded in United States. One contract gives the holder the right to buy or sell 100 shares at the specified strike price. In India, the National Stock Exchange and Bombay Stock Exchange have started option trading in certain stocks from the year 2001.

Foreign Currency Options:

Foreign currency is another important asset, which is traded on various exchanges. One among these is the Philadelphia Stock Exchange. It offers both European as well as American option contracts. Major currencies which are traded in the option markets are US dollar, Australian dollar, British pound, Canadian dollar, German mark, French franc, Japanese yen, Swiss franc, etc. The size of the contract differs currency to currency.

Index Options

Many different index options are currently traded on different exchanges in different countries. For example, the S&P 100 index at CBOE and Major Market Index at AMEX are traded in the US options markets. Similarly, in India, such Index options have been started on National Stock Exchange and Bombay Stock Exchange. Like stock option, index option's strike price is the index value at which the buyer or the option can buy or sell the underlying stock index, The strike index is converted into dollar (rupee) value by multiplying the strike index by the multiple for the contract. If the buyer of the stock index option intends to exercise the option, then the stock must be delivered, it would be complicated to settle a stock index option by



delivering all the stocks that make up that particular index. Hence, instead, stock index options are cash settlement contracts. In other words, if the option is exercised, the exchange assigned option writer pays cash to the option buyer, and there will be no delivery of any share.

The money value of the stock index underlying an index option is equal to the current cash index value multiplied by the contracts multiple. This is calculated as:
Rupee value of the underlying index = Cash index value x Contract multiples
for example, the contract multiple for the S&P 100 is \$100. So, assume, the cash index value for the S&P 100 is 750 then the dollar value of the S&P 100 contracts is $750 \times 100 = \$75,000$,

Futures Options

In a futures option (or options on futures), the underlying asset is a futures contract. An option contract on futures contract gives the buyer the rights to buy from or sell to the writer a specified future contract at a designated price at a time during the life of the options. If the futures option is a call option, the buyer has the right to acquire a long futures position.

Similarly, a put option on a futures contract give the buyer the right to sell one particular future contracts to the writer at the exercise price. It is observed that the futures contract normally matures shortly after the expiration of the option. Futures options are now available for most of the assets on which futures contracts are on the Euro dollar at CME and the Treasury bond at the CBOT,

Interest Rate Options

They are another important options contract, which are popular in the international financial markets. Interest rate options can be written on cash instruments or futures.



There are various debt instruments, which are used as instruments for interest rate options on different exchanges. These contracts are referred to as options on physicals. Recently, these interest rate options have also gained popularity on the over-the-counter markets like on treasury bonds, agency debentures and mortgage-backed securities dealers who make a market in such options on specific securities.

Leaps Options

These options contracts are created for a longer period. The longest time before expiration for a standard exchange traded option is six-months. However, Long Term Equity Anticipated Securities (LEAPS) are option contracts designed to offer with longer period maturities even up to 39 months. These LEAPS options are available on individual stocks and some indexes. Usually, they are designed for a particular purpose.

Flex Options

It is specific type of option contract where some terms of the option have been customized. The basis objective of customization of some terms is to meet the wide range of portfolio strategy needs of the institutional investors that cannot be satisfied through the standard exchange traded options. FLEX options can be created for individual stocks, stock indexes, treasury securities etc. . They are traded on an option exchange and cleared and guaranteed by the clearing house of that exchange. The value of FLEX option depends upon the ability to customize the terms dimensions, such as underlying asset, strike price, expiration date and settlement cycle. Moreover, the exchange also provides a secondary market to offset or alter positions and an independent daily marking of prices.



Option Valuation

An option provides the holder with the right to buy or sell a specified quantity of an underlying asset at a fixed price (called a strike price or an exercise price) at, or before, the expiration date of the option. Since it is a right and not an obligation, the holder can choose not to exercise the right and allow the option to expire. There are two types of options - call options and put options.

Call and Put Options:

A call option gives the buyer of the option the right to buy the underlying asset at a fixed price, called the strike or the exercise price, any time prior to the expiration date of the option: the buyer pays a price for this right. If at expiration, the value of the asset is less than the strike price, the option is not exercised and expires worthless. If, on the other hand, the value of the asset is greater than the strike price, the option is exercised - the buyer of the option, buys the stock at the exercise price and the difference between the asset value and the exercise price comprises the gross profit on the investment. The net profit on the investment is the difference between the gross profit and the price paid for the call initially.

A put option gives the buyer of the option the right to sell the underlying asset at a fixed price, again called the strike or exercise price, at any time prior to the expiration date of the option. The buyer pays a price for this right. If the price of the underlying asset is greater than the strike price, the option will not be exercised and will expire worthless. If on the other hand, the price of the underlying asset is less than the strike price, the owner of the put option will exercise the option and sell the stock at the strike price, claiming the difference between the strike price and the market value of the asset as the gross profit - again, netting out the initial cost paid for the put yields the net profit from the transaction.

A put has a negative net payoff if the value of the underlying asset exceeds the strike price, and has a gross payoff equal to the difference between the strike price and the value of the underlying asset if the asset value is less than the strike price.



Determinants of Option Value

The value of an option is determined by a number of variables relating to the underlying asset and financial markets.

1. **Current Value of the Underlying Asset:** Options are assets that derive value from an underlying asset. Consequently, changes in the value of the underlying asset affect the value of the options on that asset, Since, calls provide the right to buy the underlying asset at a fixed price, an increase in the value of the asset will increase the value of the calls, Puts, on the other hand, become less valuable as the value of the asset increase.
2. **Variance in Value of the Underlying Asset:** The buyer of an Option acquires the right to buy or sell the underlying asset at a fixed price. The higher the variance in the value of the underlying asset, the greater the value of the option. This is true for both calls and puts. While it may seem counter-intuitive that an increase in a risk measure (variance) should increase value, Options are different from other securities since buyers of options can never lose more than the price, they pay for them: in fact, they have the potential to earn significant returns from large price movements.
3. **Dividends Paid on the Underlying Asset:** The value of the underlying asset can be expected to decrease if dividend payments are made on the asset during the life of the option, Consequently, the value of a call on the asset is a decreasing function of the size of expected dividend payments, and the value of a put is an increasing function of expected dividend payments. More intuitive way of thinking about dividend payments, for call options, is as a cost of delaying exercise on in-the-money options. To see why, consider an option on a traded stock: Once a call option is in the money exercising the call option will provide the holder with the stock, and entitle him or her to the dividends on the stock in subsequent periods, failing to



exercise the option will mean that these dividends are foregone.

4. **Strike Price of Option:** A key characteristic used to describe an option is the strike price. In the case of calls, where the holder acquires the right to buy at a fixed price, the value of the call will decline as the strike price increases. In the case of puts, where the holder has the right to sell at a fixed price, the value will increase as the strike price increases.
5. **Time to Expiration on Option:** Both calls and puts become more valuable as the time to expiration increases. This is because the longer time to expiration provides more time for the value of the underlying asset to move, increasing the value of both types of options, additionally, in the case of a call, where the buyer has to pay a fixed price at expiration, the present value of this fixed price decreases as the life of the option increases, further increasing the value of the call.
6. **Riskless Interest Rate Corresponding to Life of Option:** Since the buyer of an option pays the price of the option up front, an opportunity cost is involved. This cost depends upon the level of interest rates and the time to expiration on the option. The riskless interest rate also enters into the valuation of options when the present value of the exercise price is calculated, since the exercise price does not have to be paid (received) until expiration on calls (puts). Increases in the interest rate will increase the value of calls and reduce the value of puts.

OPTION PRICING MODELS

The binomial model provides insight into the determinants of option Value. The value of an option is not determined by the expected price of the asset but by its current price, which, of course, reflects expectations about the future. This is a direct consequence of arbitrage. If the option value deviates from the value of the replicating portfolio, investors can create an arbitrage position, i.e., one that requires no investment, involves no risk, and delivers positive returns.



‘To illustrate, if the portfolio that replicates the call costs more than the call does in the market, an investor could buy the call, sell the replicating portfolio and be guaranteed the difference as a profit. The cash flows on the two positions offset each other, leading to no cash flows in subsequent periods. The option value also increases as the time to expiration is extended, as the price movements (u and d) increase, and with increases in the interest rate.

I. Game theory approach: A portfolio comprising an option and the stock is constructed in such a way that the final value of the portfolio is independent of the stock’s price, which is the only cause for uncertainty, when this uncertainty is removed using risk neutral valuation and arbitrage arguments, the options price can be determined.

2. Replicating Portfolio: In this method, a portfolio is constructed and this consists of the stock and buying/selling a risk-free zero-coupon bond. The portfolio will be constructed such that it mirrors the option payoffs for every state. Invoking the arbitrage arguments, the option price is determined as equivalent to the value at the replicating portfolio.

Binomial Option Pricing Model

The binomial model of stock price movements is a discrete time model, i.e., time is divided into discrete bits and only at these time points are stock prices modified. The binomial approach assumes that the security price obeys a binomial generating process. i.e., every point of time there are exactly two possible states – stock can move up or down. A point it is not known which of the two states will occur but the amount by which it can go up or down is assumed as known.



Two - period binomial tree

Let us understand the binomial tree's terminology. The tree depicted in Figure is a two- period binomial tree and the stock price changes two times. Each point where two lines meet is termed as a node, which represents a possible future price of the stock. The tree is called as binomial because the spot price at every node can either move up or down. If we denote the stock price at the beginning as S_0 and S_u as the stock price in an up state and S_d as the stock price in a down state, then we can define the up factor as S_u/S_0 and down factor as S_d/S_0 . The probability that the stock price will move from one node to another is called as transition probability. The binomial trees as given by Cox, Ross and Rubinstein, CRR hereafter have some important characteristics, which are given below:

1. Length of the time interval remains constant throughout the tree, i.e., if the interval between the nodes is in months, it will be months everywhere and if it is in terms of years, it will years everywhere.
2. Volatility remains constant throughout the tree.
3. Transition probability remains the same in the entire tree.
4. The trees are recombining, i.e., an up move followed by a down move will take the stock to the same value as a down move followed by an up move.

Single Period Binomial Model

Assume that a stock price follows 4 binomial model and we are interested in finding the price of a European option that expires at the end of one period. As explained earlier in the numerical example, formulate a hedge portfolio that exactly imitates the payoff of the call option in all the states.



Multi-Period Binomial Model

Earlier we considered that the time between now and the maturity day of the option is one period but the binomial model can be used to price an option wherein the life of the option may be divided into any number of periods or steps. The procedure of pricing the option remains the same.

Black-Scholes Option Pricing Model (BSOPM)

BSOPM was introduced much earlier than binomial option pricing, but for ease of understanding we first considered the binomial model. In fact, Black – Scholes provided the first ever closed form of solution for pricing the European calls in 1973 and published the path-breaking paper titled “The pricing of options and corporate liabilities” in Journal of Political Economy. Prof. Scholes and Prof. Merton were awarded the Nobel Prize for their contributions in option pricing. The data inputs to this model are current stock price, exercise price, expected volatility, interest rate and time to expiry. The pricing intuition remains the same - construct a replicating hedge. ‘The hedge portfolio will be constituted in such a way that at any given point of time its value will always be equal to the option’s price at that time. If the option’s price differs from the hedge portfolio’s value, then arbitrageurs’ actions will bring back the equilibrium relationship. The proportion of stocks and bonds will be determined by the Black - Scholes formula.

As the formula depends on constantly changing factors like volatility, current market price of the stock, etc., the portfolio mix has to be constantly adjusted so that it will reflect the current outputs of Black—Scholes. Hence this portfolio is called as dynamic portfolio and the act of maintaining the portfolio in balance is called as hedge rebalancing. The mathematical derivation of the Black - Scholes model is quite complicated and requires understanding of a sophisticated branch of mathematics called as stochastic calculus.



B-S Model Assumptions and Limitations

Just as with most other models in finance, BSOPM is also based on some assumptions, which are as follows:

- (a) Frictionless markets. More precisely it means there are no transaction costs, short selling is permitted, existence of similar borrowing and lending rules

- (b) The asset pays zero dividends. This is also not an implausible assumption at least in the short run. But subsequent models in the literature proposed some adjustments in the basic BSOPM to incorporate dividend/ Intermediate income.

- (c) The option is European style

- (d) Asset prices follow a geometric Brownian motion. In other words, asset returns are normal and stationary. Many critics called this assumption as the biggest hole in the B-S formula, including its inventor Prof. Fisher Black is an influential article in the Journal of Applied Corporate Finance in 1989.

But this way of making simplifying assumptions to describe the complex real world more well-mannered is followed in many disciplines of sciences and also in economics and finance from ages, and in that spirit this model is not an exception. More importantly, despite these seemingly deficient assumptions, the model does a reasonable job in pricing a variety of derivative instruments.

Features of an option contract

Premium or down payment:

The holder of this type of contract must pay a certain amount called the 'premium' for having the right to exercise an options trade. In case the holder does not exercise it, s/he loses the premium amount. Usually, the premium is deducted from the total payoff, and the investor receives the balance.



Strike price:

This refers to the rate at which the owner of the option can buy or sell the underlying security if s/he decides to exercise the contract. The strike price is fixed and does not change during the entire period of the validity of the contract.

Contract size:

The contract size is the deliverable quantity of an underlying asset in an options contract. These quantities are fixed for an asset. If the contract is for 100 shares, then when a holder exercises one option contract, there will be a buying or selling of 100 shares.

Expiration date:

Every contract comes with a defined expiry date. This remains unchanged until the validity of the contract. If the option is not exercised within this date, it expires.

Intrinsic value:

An intrinsic value is the strike price minus the current price of the underlying security. Money call options have an intrinsic value.

Settlement of an option:

There is no buying, selling or exchange of securities when an options contract is written. The contract is settled when the holder exercises his/her right to trade. In case the holder does not exercise his/her right till maturity, the contract will lapse on its own, and no settlement will be required.

No obligation to buy or sell:

In case of option contracts, the investor has the option to buy or sell the underlying asset by the expiration date. But he is under no obligation to purchase or sell. If an option holder does not buy or sell, the option lapses.



Basic Principles of option trading

Here are 10 key principles that newcomers to options should keep in mind as they approach the options arena.

- **Know the difference between using options to invest and using options to trade:** Investors focus on the benefits of long-term stock ownership, and they should use options to buy, sell, or protect stock positions, or to increase income from stock positions. Consider an investor planning to buy stock when he receives a year-end bonus.
- **Investors who use options need a plan:** Covered writers must know whether or not they are willing to sell the underlying stock. If not, it is best to decide in advance at what price the call will be repurchased or rolled to another option.
- **Understand how and why option prices change:** Option prices change differently than stock prices, so option traders need to plan differently than stock traders. A typical complaint from newcomers to options is: "The stock went up, but my call didn't!" Understanding how prices change is essential to using options successfully.
- **Option traders need discipline in taking profits and losses:** First, have a profit target and close or reduce the size of a position if that price is reached. Second, have a stop-loss point and close or reduce the size of a position at that price. Third, have a time limit and close or reduce the size of a position if neither the profit target nor the stop-loss points are reached by the end of the time period.
- **Do not get freaked out by volatility:** Conceptually, options are similar to insurance, and the volatility factor in options corresponds to the risk factor in insurance. It is an important factor, but it is not the only factor. While the concept of volatility is not intuitively obvious to newcomers, it can be learned if one is patient.



- **Have realistic expectations:** Mastering the concepts of delta and theta (time decay) is an important step toward the goal of developing realistic expectations about how option prices might and might not change and how much profit potential and risk each strategy has.
- **Buying under-valued options" and "selling over-valued options are not sufficient strategies:** "Value" is a subjective determination that every trader must make individually. Option traders must focus on their three-part forecast as much as or more than the "value" of an option.
- **Selling options" is not a better strategy than "buying options:** It is a myth that 80-90% of options expire worthless. Approximately one third, or 33%, of options expire worthless while 10-15% is exercised. The rest are closed prior to expiration.
- **Leverage is a double-edged sword:** Option traders should manage their capital differently than stock traders.

SWAPS

A Swap is the exchange of cash flows or a set of financial obligation between two parties over time. Swaps involve agreement between two parties for a specified period of time. A party can cancel the agreement before the end of the term by paying a final difference to the other party. Swaps have become one of the popular financial derivatives with the deregulation and increasing volatility of interest and exchange rates. Firms use swaps to tap the international financial markets. A swap is a derivative contract between two parties that involves the exchange of pre-agreed cash flows of two financial instruments. The cash flows are usually determined using the notional principal amount (a predetermined nominal value). Each stream of the cash flows is called a “leg.”



Introduced in the late 1980s, swaps are a relatively new type of derivative. Even though relatively new, their simplicity, coupled with their extensive applications, makes them one of the most frequently traded financial contracts. Corporate finance professionals may use swap contracts to hedge risk and minimize the uncertainty of certain operations. For example, sometimes projects can be exposed to exchange rate risk and the Company's CFO may use a currency swap contract as a hedging instrument. Unlike futures and options, swaps are not traded on exchanges but over-the-counter. In addition, counterparties in swaps are usually companies and financial organizations and not individuals, because there is always a high risk of counterparty default in swap contracts.

Some financial institutions usually participate as the market makers of swap markets. The institutions, which are also known as swap banks, facilitate the transactions by matching counterparties.

Applications of Swaps

Nowadays, swaps are an essential part of modern finance. They can be used in the following ways:

1 Risk hedging

One of the primary functions of swaps is the hedging of risks. For example, interest rate swaps can hedge against interest rate fluctuations, and currency swaps are used to hedge against currency exchange rate fluctuations.

2 Access to new markets

Companies can use swaps as a tool for accessing previously unavailable markets. For example, a US company can opt to enter into a currency swap with a British company to access the more attractive dollar-to-pound exchange rate, because the UK-based firm can borrow domestically at a lower rate.



Features of swaps

The following are features of financial swaps:

Counter parties: Financial swaps involve the agreement between two or more parties to exchange cash flows or the parties interested in exchanging the liabilities.

Facilitators: The amount of cash flow exchange between parties is huge and also the process is complex. Therefore, to facilitate the transaction, an intermediary comes into picture which brings different parties together for big deal. These may be brokers whose objective is to initiate the counterparties to finalize the swap deal. While swap dealers are themselves counter parties who bear risk and provide portfolio management service.

Cash flows: The present values of future cash flows are estimated by the counterparties before entering into a contract. Both the parties want to get assurance of exchanging same financial liabilities before the swap deal.

Less documentation: is required in case of swap deals because the deals are based on the needs of parties, therefore, fewer complexes and less risk consuming.

Transaction costs: Generating very less percentage is involved in swap agreement.

Benefit to both parties: The swap agreement will be attractive only when parties get benefits of these agreements.

Default-risk: is higher in swaps than the option and futures because the parties may default the payment.

Evaluation of swaps

The value of a swap depends upon so many factors such as the nature of swap, interest rate risks, expiry time, value at expiration, fixed and floating rates of interest, the principal amount and many more. Let's discuss the valuation aspect of an interest rate swap.



Evaluation of interest rate swap: At the initiation stage the worth of an interest swap is zero or nearly zero. With the passage of time, this value may be positive or negative. The fixed rate interest swap is valued by treating the fixed rate payments as cash flows on a traditional bond and the floating rate swap value is quite equivalent to a floating rate note (FRN). If there is no default risk, the value of an interest swap can be computed either as a long position in one bond combined with a short position in another bond or as a portfolio of forward contracts. Since in a swap agreement the principal is not exchanged. Some financial intermediaries act as market makers and they are ready to quote a bid and an offer for the fixed rate which they will exchange for floating. The bid rate in a contract where the market maker will pay fixed and receive floating while the offer rate in a swap the market maker will receive fixed and pay floating. These rates are quoted for the number of maturities and number of different currencies

Evaluation of a currency swap: The currency swaps can be valued as the difference between the present values of the conventional bonds. The computation of a currency swap is just equivalent to the valuation of interest rate swaps. Suppose that there is no default risk and S^* is the spot exchange rate (expressed as the number of units of domestic currency per unit of a foreign currency), the value of the currency swap will be given by: $V_{cusw} = S^*B_f - B_d$ Where V_{cusw} is the value of currency swap, B_f is the value of foreign currency bond (foreign currency) and B_d is the value of domestic currency bond underlying the swap. In this case the valuation of currency swap can be done based on of interest rates in domestic currency, term structure of interest in foreign currency and the spot exchange rate. The value of bond equivalent to the foreign currency interest flows has the value as: $\sum_{t=1}^n \frac{k_f}{1+r_f^t} + \frac{P}{1+r_f^n}$ (5.3) Where k_f is the foreign currency interest flows, r_f is the foreign currency discount rate, t_i is the corresponding time periods to the interest payments and P is the principal sum in foreign currency. Similarly, the bond equivalent to the domestic



currency cash flow be determined as follows: $\sum_{t=1}^n \frac{C_t}{(1+r)^t} + \frac{P}{(1+r)^n}$ where k_d is the fixed foreign currency interest payments, r is the discount rate for various periods to cash flow, t is the length of those time periods to cash flows, S' is the exchange P is the principal expressed in foreign currency converted into equivalent domestic currency principal.

Rationale behind swapping

To avoid risk of fluctuation in forex, interest rates, stock indices investors attitude etc. the swap market has merged now to explain that why firms and people want to enter into swap agreement. The rationale can be explained by the following points:

- Market in perfection and inefficiency
- Different risk preferences
- Government regulation
- Funding at low cost
- Demand supply imbalance
- To improve financial records

Imperfect market: As you know that the swap agreements are meant for transforming financial claims to reduce risk. Since there lie different reasons for the growth in swap market and the most important to the imperfection and inefficiency in the markets. The swap agreements are required in order to investigate market imperfections, difference of attitude of investors, information asymmetry, tax and regulatory structure by the government, various kinds of financial norms and regulations etc. Had there been a uniformity of standards and norms and perfect market conditions, swaps could not have generated much enthusiasm. Hence due to imperfect capital market conditions, swaps give opportunity to the investors for hedging the risk.



Differing risk profiles: The basis of credit rating of bonds by financial institutions, banks and individual investor is quite different. In other words, the computation of risks are different from point of view of individual, institutional and other types of investor, thereby changing the risk profile. Based on this, the investor has to take decision to hedge, speculate or arbitrage opportunity. In some markets, the company can raise funds at lower cost and can swap for a particular market. A low credit rated firm can raise funds from floating rate credit market and enjoy comparative advantage over highly rated company because it pay a smaller risk premium. The differing interest rates in different markets can be arbitrated and disbursed between the counter parties.

Regulation by govt: The regulatory practices of government of different nations can make attractive or unattractive the swap markets. Sometimes the government restricts the funding by foreign companies to protect the interest of the domestic investors. It may also happen that to attract foreign companies the government opens the domestic markets. This phenomenon of the government rule and regulations influence the growth of swap agreements.

Funding at low cost: In some businesses suppose export financing, there exists subsidized funding and currency swap agreements can take advantage of this situation. The company can swap the exchange risk by entering into a favorable currency swap.

Demand and supply forces: Depending on the needs of the country and its development plans, the central bank squeezes the reserve requirements there by increasing the supply of the funds because of resultant lowering of interest rates. Definitely the borrowers will be interested in those markets where there is a sufficient supply of funds. Thus the borrowers can take arbitrage opportunity in his favor due to different economic conditions



Matches Asset-Liability: The counter parties involved in swap some times desire to make the match between asset and liability. For this purpose they take the help of swap and funds can be tapped as per the requirements of the companies. Therefore, differing rates of interests in different markets and over time changes in the same provide arbitrage opportunities which can be tapped by currency swap agreements.

TYPES OF SWAPS

Swaps may be of the following three types.

1. Interest rate swaps.
2. Currency swaps.
3. A combination of these.

1. Interest Rate Swaps

An interest rate swap is an agreement between two parties to exchange interest payment obligations. There is no exchange of principal either at the outset or at maturity. Principals are 'notional' and fixed purely for calculation purposes. Interest rate swap transaction involves payment of interest on the 'notional' principal calculated at a fixed rate against the receipt of interest calculated at a floating rate. When combined with an asset or a liability, an interest rate swap (IRS) can change its risk characteristics by changing the net cash flow e.g. a fixed-rate liability can be converted to a floating-rate liability.

2. Currency Swaps

Currency swaps are used to convert borrowings in one currency (usually foreign currency) into borrowings in another currency (domestic currency) to achieve significantly better funding costs than a simple debt issue in the domestic currency. Borrowers with funding advantages in different markets can exchange these benefits to gain attractive funding costs in non-domestic currencies.



A currency swap is a contract between two counter-parties involving exchange of cash flows in two different currencies. A currency swap can be of two types.

(a) Coupon Swap. Coupon swap involves only exchange of coupon rate, the principal is not exchanged. Coupon swap thus take a view on only the interest payments while leaving principal untouched.

(b) Cross Currency Swap. In cross currency swaps, both the principal and coupon payments are exchanged. The currency rate for the final exchange is set at the beginning of the swap hence company is locked into the current spot rate for the principal exchange at maturity. Cross currency swap gives significantly higher interest rate saving compared to the coupon swap. Because there is a liquid two-way market, cross currency swaps can be tailored to meet the requirements of almost any counter parties.

The market for currency swaps is much smaller and more diverse than that for interest-rate swaps. As off-balance sheet items, currency swaps have lately become very useful in hedging long term exposures in foreign currency.

Debt-Equity Swaps

Debt or equity swaps act as a refinancing deal that involves the exchange of debt for equity. In this swap, the debt holder gets an equity position for the cancellation of the debt. It paves a way for struggling companies to relocate their capital structure. Since such companies can't pay off their debts, they opt to get involved in debt-equity swaps to delay the payment. While some debt holders have to agree to this swap due to bankruptcy, others do have a choice in the matter as some companies engage in debt-equity swaps to reap the benefits of the favourable market conditions. The covenants in the bond indenture may oppose and prevent the swap without consent. For instance, businesses often offer attractive trade ratios like 1:2 wherein the bondholder receives stocks worth twice the value of his bonds, which makes the trade more enticing.



Total Return Swaps

In total return swaps, the overall returns from an asset are traded for a fixed (or variable) interest rate. This exposes the party that is paying the fixed rate to the underlying asset which is usually a stock, bond or index. Hence the second party can reap benefits from this asset without actually owning it. The parties involved in this swap are called total return payer and total return receiver.

Credit Default Swap (CDS)

In CDS, both the parties get into an agreement in which the one pays the lost principal and interest of a loan to the CDS buyer in case a borrower defaults on the loan. CDS swap was one of the major contributing factors in the 2008 financial crisis along with poor risk management and excessive leverage as the investors offset their credit risk with that of another investor. The majority of the CDS contracts are maintained via an ongoing premium payment (which is quite similar to the regular premiums due on an insurance policy) and usually involve mortgage-backed securities or municipal and corporate bonds.



UNIT III

FUTURES

FUTURES

A future contract is an agreement between a seller and buyer that calls for the seller (called short) to deliver to the buyer (called the long) a specified quantity, grade of an identified commodity at a fixed time in the future and at a price agreed to when the contract is first entered into. A future contract may be defined as a "commitment to buy or sell at a specified future settlement date and a designated amount of commodity or a financial asset under the common rules and strict supervision of a regulated market like stock exchanges, commodity exchanges etc. It legally binds the two parties to take/make the delivery of commodity subject to the terms and conditions of the contract.

Investors opt for futures trading to hedge investments and buy them at a predetermined price at an already decided specific date. According to the futures contract, the buyer must buy, and the seller must sell before the expiration date. This is just a rudimentary futures contract let us discuss more and understand the futures meaning and how it works. The futures contract is a financial product that involves derivatives trading. A derivative is a financial contract whose value is determined basis the value of the underlying asset. As mentioned earlier future contracts are similar financial products which are contracts made between buyer and seller where the buyer buys the derivative at the fixed price. Eventually, the contract price fluctuates relative to the fixed price of the trade and thus profit or loss is generated.

Future trading involves obligation which makes it mandatory for the buyer and seller to abide by the agreement and complete the trade on a predetermined date and price. The predetermined time. futures trading is called delivery date and the fixed price is called futures price.



To become more familiar with futures meaning you need to understand the following points –

- The value of future contracts is influenced by the value of the underlying asset. If the value of underlying assets rises it increases the value of future contracts too
- Future contracts can be transferred and can be traded. If the seller wants to move out of the contract the seller can transfer the ownership to some other party. This applies to the buyer as well
- Future contracts involve obligation from both the parties hence these contracts must be properly regulated to avoid chances of default. In India, SEBI looks after the futures trading to ensure smooth functioning
- Future contracts follow a standardized procedure and cannot be customized by any individual and the conditions cannot be negotiated

Benefits of futures contracts

Prospectively higher returns

Futures denote highly leveraged investments. To actually buy a futures contract, you need to pay only a fraction of the actual value of the contract, say 10%. This 10% is termed as margin and is more like a security deposit to ensure cover for losses in case your contract doesn't perform as you expected.

No need to hold physical gold

Futures contracts are mostly used as speculative instruments that are basically carried out on paper. You don't actually hold a tonne of gold or 5,000 barrels of oil in your house – you simply have a paper confirming that you hold a specified quantity of the commodity. Exchange of commodity happens in the rare times of delivery of contracts.



A fairer market

Getting 'insider information' is very difficult in commodities trading. Also, market reports are provided toward the end of trading sessions, enabling you to make more informed decisions for the next day.

Liquidity

There are huge numbers of contracts traded daily on futures. This makes it possible to place orders quickly as there are lots of buyers and sellers actively trading a commodity. Prices also tend to post gradual appreciation or depreciation instead of large jumps, especially so for nearer contracts of next few weeks or months.

Smaller commissions

The commission charges are generally lower compared with other investments and applied depending upon the type of service offered.

Option trading strategies

Long call

The buyer buys trade at the earlier decided price on a future date.

Short call

When the seller sells the trade at the predetermined price on a future date

Short put

In this strategy, the seller is obliged to sell however the buyer can exercise the option contract. The buyer usually practices this when the value of the stock has gone higher than the predetermined price.

Long put

The buyer can buy the trade at a predetermined price and the seller must agree to that price.



Bull put spread

When a party sells and buys two contracts and the predetermined price of one of the contracts is higher than the other.

Bear call spread

Similar to the above two option contracts are involved in this strategy. The strike price of the contract bought should be higher than the strike price of the contract sold.

Types of Future Contracts

Future contracts can be divided broadly into two categories:

1. Commodity Futures. Under commodity futures the commodity is exchanged for cash in the spot market at the previously determined price. The transaction takes place in the commodity market. Volatility in price with time is hedged.

2. Financial Futures. Financial futures are further divided into three categories as explained below:

(a) Interest Rate Future. In this type of contracts, securities are purchased or sold in future at a predetermined interest rate. There may be (z) short-term interest rate futures where transaction takes place in the money market, and (z/z) long-term interest-rate futures where transaction takes place in the capital market.

(b) Stock-Index Futures. The stock index futures are traded on the basis of different share price indices rather than on any individual share. Under this type of contract, the stock-index is fixed at a particular level for the future transaction. This transaction is settled in cash for the difference in the two indices.

Price of one basis point in the index is already decided. Transactions take place in the cash market. These futures hedge the variability in stock index with time.

(b) Currency Futures. Two currencies are exchanged in future at a previously agreed exchange rate in the forex market. These futures take care of the variability in exchange rate with time. However with the launch of the 'Euro' on January 1st, 1999, the demand for currency future contracts on the exchange rate among countries in the euro zone has eliminated.



Operators/Traders in Futures Market globally

Futures contracts are bought and sold by a large number of individuals, business organizations, governments and others for a variety of purposes. The traders in the futures market can be categorized on the basis of the purposes for which they deal in this market. Usually, financial derivatives attract following types of traders which are discussed here as under.

Hedgers

In simple term, a hedge is a position taken in futures or other markets for the purpose of reducing exposure to one or more types of risk. A person who undertakes such position is called as 'hedger'. In other words, a hedger uses futures markets to reduce risk caused by the movements in prices of securities, commodities, exchange rates, interest rates, indices, etc. As such, a hedger will take a position in futures market that is opposite a risk to which he or she is exposed. By taking an opposite position to a perceived risk is called 'hedging strategy in futures markets. The essence of hedging Strategy is the adoption of a futures position that, on average, generates profits when the market value of the commitment is higher than the expected value. For example, a treasurer of a company Knows the foreign currency amounts to be received at certain futures time may hedge the foreign exchange risk by taking a short position (selling the foreign currency at a particulars rate) in the futures markets. Similarly, he can take a long position (buying the foreign currency at a particular rate) in case of futures foreign exchange payments at a specified futures date.

The hedging strategy can be undertaken in all the markets like futures, forwards, options, swap, etc. but their modus operandi will be different. Forward agreements are designed to offset risk by fixing the price that the hedger will pay or receive for the underlying asset, in case of option strategy, it provides insurance and protects the investor against adverse price movements. Similarly, in the futures market, the investors may be benefited from favorable price movements.



Speculators

A speculator may be defined as an investor who is willing to take a risk by taking futures position with the expectation to earn profits. The speculator forecasts the future economic conditions and decides which position (long or short) to the taker that will yield a profit if the forecast is realized. For example, suppose a speculator has forecasted that price of gold would be Rs 5500 per 10 grams after one month. If the current gold price is Rs 5400 per 10 grams, he can take a long position in gold and expects to make a profit of Rs 100 per 10 grams. This expected profit is associated with risk because the gold price after one month may decrease to Rs 5300 per 14 grams, and may lose Rs 100 per 10 grams. Speculators usually trade in the futures markets to earn profit on the basis of difference in spot and futures prices of the underlying assets. Hedgers use the futures markets for avoiding exposure to adverse movements in the price of an asset whereas the speculators wish to take position in the market based upon such movements in the price of that asset. It is pertinent to mention here that there is difference in speculating trading between spot market and forward market. In spot market a speculator has to make an initial cash payment equal to the total value of the asset purchased whereas no initial cash payment except the margin money, if any, to enter into forward market. Therefore, speculative trading provides the investor with a much higher level of leverage than speculating using spot markets. That is why, futures markets, being highly leveraged market, minimums are set to ensure that the speculator can afford any potential losses.

Arbitrageurs

Arbitrageurs are another important group of participants in futures markets. An arbitrageur is a trader who attempts to make profits by locking in a riskless trading by simultaneously entering into transactions in two or more markets. In other words, an arbitrageur tries to earn riskless profits from discrepancies between futures and spot prices and among different futures prices. For example, suppose that at the expiration of the gold futures contract, the futures price is Rs 5500 per 10 grams, but



the spot price is Rs 5480 per 10 grams. In this situation, an arbitrageur could purchase the gold for Rs 5480 and go short a futures contract that expires immediately, and in this way making a profit of Rs 20 per (0 grams by delivering the gold for Rs 5500 in the absence of transaction costs.

The arbitrage opportunities available in the different markets usually do not last long because of heavy transactions by the arbitrageurs where such opportunity arises. Thus, arbitrage keeps the futures and cash prices in line with one another. This relationship is also expressed by the simple cost of carry pricing which shows that fair futures prices, is the set of buying the cash asset now and financing the same till delivery in futures market. It is generalized that the active trading & of arbitrageurs will leave small arbitrage opportunities in the financial markets. In brief, arbitrage trading helps to make market liquid, ensure accurate pricing and enhance price stability; it involves making profits from relative mispricing,

Spreaders

Spreading is a specific trading activity in which off setting futures position is involved by creating almost net position. So, the spreaders believe in lower expected return but at the less risk. For a successful trading in spreading, the spreaders must forecast the relevant factors which affect the changes in the spreads. interest rate behavior is an important factor which causes changes in the Spreads in a profitable spread position, normally, there is large gain on one side of the spread in comparison to the loss on the other side of the spread. in this way, a spread reduces the risk even if the forecast is incorrect, On the other hand, the pure speculators would make money by taking only the profitable side of the market but at very high risk.



Benefits of futures contracts

Prospectively higher returns

Futures denote highly leveraged investments. To actually buy a futures contract, you need to pay only a fraction of the actual value of the contract, say 10%. This 10% is termed as margin and is more like a security deposit to ensure cover for losses in case your contract doesn't perform as you expected.

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Futures contracts are mostly used as speculative instruments that are basically carried out on paper. You don't actually hold a tonne of gold or 5,000 barrels of oil in your house – you simply have a paper confirming that you hold a specified quantity of the commodity. Exchange of commodity happens in the rare times of delivery of contracts.

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Smaller commissions

The commission charges are generally lower compared with other investments and applied depending upon the type of service offered.



Evolution of Futures markets in India

The first futures trading exchange was the Dojima Rice Exchange, established in 1730 in Japan for the purpose of trading rice futures. Western commodity futures markets started trading in England during the 16th century, but the nation's first official commodity trading exchange, the London Metals and Market Exchange, was not established until 1877. Commodities markets were created to reduce the risks born by both producers and wholesalers. Farmers got a price guarantee up front, and the cash to carry them through until the harvest. Wholesalers were assured of an adequate supply of the product they needed at a set price when they needed it. Both parties took some risk that they could have gotten a better deal if they'd waited. That original purpose has not altogether disappeared but today's trading in futures is an investment class all on its own and most of the buyers have no intention of accepting the delivery of a ton of wheat or a herd of cows.

Futures Trading in the U.S.

The United States got its earliest official commodity trading exchange in the West in 1848. The Chicago Board of Trade (CBOT) was created as railroads and the telegraph service established fast connections from the agricultural marketplace hub of Chicago to New York and other cities in the eastern U.S. The first traded futures contracts in the U.S. were for corn. Wheat and soybeans markets followed. These three core agricultural commodities still account for the bulk of trading business conducted at the CBOT. The next large market for trading futures contracts was the cotton market. Forward contracts in cotton began trading in New York in the 1850s, leading eventually to the establishment of the New York Cotton Exchange (NYCE) in 1870.



Modern Futures Markets

The 1970s saw a great expansion in futures trading markets.

The Chicago Mercantile Exchange (CME) started offering futures trading in foreign currencies. The Chicago Board of Trade (CBOT) traded T-bonds. The New York Mercantile Exchange (NYMEX) began offering trading in various financial futures, including crude oil and natural gas. The Commodities Exchange (COMEX) provided futures trading in gold, silver, and copper, and later added platinum and palladium when gold ceased to be pegged to the U.S. dollar. The rapid expansion of trading in financial futures led to the creation of futures contracts on the Dow Jones and S&P 500 stock indexes. Although there are now futures trading exchanges worldwide, the U.S. exchanges remain the most widely traded, due in large part to the fact that two of the most heavily traded markets are the U.S. bond market and the wheat market.

Functions and Growth of futures market in India

Pricing

Commodities exchanges allow the trading of agricultural products, livestock, foreign currencies, oil, precious metals and other products and establish prices for products around the world. Commodities prices are determined by the market forces of supply and demand in the trading pits of the exchanges by public open outcry. What appears chaotic actually is well-organized, as brokers, buying and selling for themselves and their clients, use hand signals to trade. Prices reported from the commodities exchanges are communicated around the world and are used as the basis for numerous economic and political decisions.



Organizing Markets

Futures exchanges such as the New York Mercantile Exchange and the Chicago Board of Trade fulfill an essential economic function by providing organized marketplaces with standardized contracts. Without this function, futures transactions would be negotiated independently with no structure at all. Each futures exchange maintains its own clearinghouse that fulfills all transactions. This provides stability to the market, as the clearinghouse acts as the other party in all transactions. Because traders are buying and selling contracts throughout the day, their buys and sells may not be equal when trading ends. Traders settle any imbalances once at the end of the trading day with the exchange rather than settling each trade separately.

Hedging

Merchants, farmers and international firms use the futures exchanges to hedge future transactions. When a farmer plants his crop of wheat, for example, he does not know what the price will be at harvest time. To remove the risk of price changes, he sells wheat futures contracts at planting time. When he sells his crop a few months later, he

buys back the futures contracts. If wheat prices have fallen, he is protected because the futures contracts he buys at harvest cost less than the ones he sold at planting. An importing firm can use financial futures contracts in the same manner to lock in a price for the goods it will be importing later in the year.

Speculating

Speculators fill the important economic function of providing liquidity to an exchange. With the money that speculators bring to the exchanges, the spread between bid and ask prices is much narrower than it otherwise would be; commodity prices would fluctuate more erratically without the participation of speculators. When hedgers buy and sell contracts to cover their risks, it is the speculative commodity traders who assume those risks, thereby helping stabilize prices.



Financing Function

Another important function of a futures market is to raise finance against the stock of assets or commodities. Since futures contracts are standardized contracts, so they make it easier for the lenders about the assurance of quantity, quality and liquidity of the underlying asset. Though this function is very much familiar in the spot market, but it is also unique to futures markets. The reason being the lenders are often more interested to finance hedged asset stock rather than un-hedged stock because the hedged asset stock is protected against the risk of loss of value.

Liquidity Function

They are operated on the basis of margins which are determined on the basis of risks involved in the contract. Under this the buyer and the seller have to deposit only a fraction of the contract value, say 5 percent or 10 percent, known as margins. It means that the traders in the futures market can do the business a much larger volume of contracts than in a spot market, and thus, makes market more Liquid. That is why the volume of the futures markets is much larger in comparison to the spot markets. This is also known as gearing or leverage factor. It means that a trader in the future markets can gear up his capital 10 times and 20 times if the margin/deposit is 10 percent and 5 percent respectively, resulting in his profit or loss, as a proportion of his capital is 10 times or 20 times magnified.

Price Stabilization Function

Another important function of a futures market is to keep a Stabilizing influence on spot prices by reducing the amplitude of short term of fluctuations. In other words, Futures market reduces both the heights of the peaks and the depth of the troughs,



Theories of future pricing

Futures are derivative products whose value depends largely on the price of the underlying stocks or indices. However, the pricing is not that direct. There remains a difference between the prices of the underlying asset in the cash segment and in the derivatives segment. This difference can be understood through two simple pricing models for futures contracts. These will allow you to estimate how the price of a stock futures or index futures contract might behave. These are:

- The Cost of Carry Model
- The Expectancy Model

However, remember that these models merely give you platform on which to base your understanding of futures prices. That said, being aware of these theories gives you a feel of what you can expect from the futures price of a stock or an index.

COST OF CARRY MODEL

The Cost of Carry Model assumes that markets tend to be perfectly efficient. This means there are no differences in the cash and futures price. This, thereby, eliminates any opportunity for arbitrage – the phenomenon where traders take advantage of price differences in two or more markets. When there is no opportunity for arbitrage, investors are indifferent to the spot and futures market prices while they trade in the underlying asset. This is because their final earnings are eventually the same.

The model also assumes, for simplicity sake, that the contract is held till maturity, so that a fair price can be arrived at.

In short, the price of a futures contract (FP) will be equal to the spot price (SP) plus the net cost incurred in carrying the asset till the maturity date of the futures contract.

$$FP = SP + (\text{Carry Cost} - \text{Carry Return})$$

Here Carry Cost refers to the cost of holding the asset till the futures contract matures. This could include storage cost, interest paid to acquire and hold the asset, financing costs etc. Carry Return refers to any income derived from the asset while holding it like



dividends, bonuses etc. While calculating the futures price of an index, the Carry Return refers to the average returns given by the index during the holding period in the cash market. A net of these two is called the net cost of carry. The bottom line of this pricing model is that keeping a position open in the cash market can have benefits or costs. The price of a futures contract basically reflects these costs or benefits to charge or reward you accordingly.

EXPECTANCY MODEL OF FUTURES PRICING

The Expectancy Model of futures pricing states that the futures price of an asset is basically what the spot price of the asset is expected to be in the future. This means, if the overall market sentiment leans towards a higher price for an asset in the future, the futures price of the asset will be positive. In the exact same way, a rise in bearish sentiments in the market would lead to a fall in the futures price of the asset.

Unlike the Cost of Carry model, this model believes that there is no relationship between the present spot price of the asset and its futures price. What matters is only what the future spot price of the asset is expected to be. This is also why many stock market participants look to the trends in futures prices to anticipate the price fluctuation in the cash segment.

Risk aversion

It is the tendency to avoid risk. The term risk-averse describes the investor who chooses the preservation of capital over the potential for a higher-than-average return. In investing, risk equals price volatility. A volatile investment can make you rich or devour your savings. A conservative investment will grow slowly and steadily over time. Low-risk means more stability. A low-risk investment guarantees a reasonable if unspectacular return, with a near-zero chance that any of the original investment will be lost. Generally, the return on a low-risk investment will match, or slightly exceed, the level of inflation over time. A high-risk investment may gain or lose a bundle of money.



Risk-Averse Investment Choices

Risk-averse investors typically invest their money in savings accounts, certificates of deposit (CDs), municipal and corporate bonds, and dividend growth stocks. All of the above, except for municipal and corporate bonds and dividend growth stocks, virtually guarantee that the amount invested will still be there whenever the investor chooses to cash it in. Dividend growth stocks, like any stock shares, move up or down in value. However, they are known for two major attributes: They are shares of mature companies with proven track records and a steady flow of income, and they regularly pay their investors a dividend. This dividend can be paid to the investor as an income supplement or reinvested in the company's stock to add to the account's growth over time.

Risk-Averse Attributes

Risk-averse investors also are known as conservative investors. They are, by nature or by circumstances, unwilling to accept volatility in their investment portfolios. They want their investments to be highly liquid. That is, that money must be there in full when they're ready to make a withdrawal. No waiting for the markets to swing up again.

Risk Averse Investment Strategies

In addition to individual assets or asset classes that cater to risk averse investors, there are also a number of risk-averse investment strategies that can be employed to minimize losses. One way is through diversification of your portfolio. Diversification means including assets and asset classes that are not highly correlated with one another. This way you are not putting all of your eggs into one basket, and if some securities fall in a given day, others may rise to offset those individual losses. Mathematically, diversification allows you to maximize your expected return while minimizing your overall portfolio risk. Income investing is another strategy that focuses on holding bonds and other fixed-income securities that generate regular cash flows, as opposed to seeking capital gains. Investment income is especially useful for retirees who no longer



have employment income and cannot afford to experience losses in the markets. Income investing does come with certain other risks such as due to inflation or negative credit events. Bond and CD laddering along with inflation-protected securities can help lower your overall fixed income portfolio risk.

Advantages and Disadvantages of Being Risk Averse

Exhibiting risk aversion means to shy away from risk, and in terms of investing means avoiding risky securities. Risk averse individuals should seek out investments and strategies that fit this low risk tolerance. As such, one advantage is that the risk of losses are minimized. Investing in low-risk products like fixed-income securities can also mean guaranteed cash flows and constant positive returns over time. However, with low risk comes low expected return. In fact, the risk-return tradeoff does not favor a risk averse investor who shies away from stocks and other risky assets. Such risk averse investors will tend to enjoy lower total returns, especially over long time horizons. Risk aversion can also lead people to irrationally avoid otherwise good opportunities and may stay away from the markets entirely, putting them at a disadvantage when saving for things like retirement.

Moreover, money kept idle in savings or "under the mattress" will lose buying power over time as it is eroded by inflation.

Pros

- **Minimizes risk of losses**
- **Can generate steady income**
- **Guaranteed cash flows**

Cons

- **Much lower expected returns, especially over time**
- **Missed opportunities (opportunity cost)**
- **Inflation erodes buying power of savings**



Forward Contract versus Futures Contract

A forward contract is a customized contractual agreement where two private parties agree to trade a particular asset with each other at an agreed specific price and time in the future. Forward contracts are traded privately over-the-counter, not on an exchange.

A futures contract often referred to as futures is a standardized version of a forward contract that is publicly traded on a futures exchange. Like a forward contract, a futures contract includes an agreed upon price and time in the future to buy or sell an asset usually stocks, bonds, or commodities, like gold.

The main differentiating feature between futures and forward contracts that futures are publicly traded on an exchange while forwards are privately traded results in several operational differences between them. This comparison examines differences like counterparty risk, daily centralized clearing and mark-to-market, price transparency, and efficiency.

Forward Contract versus Futures Contract comparison chart

	Forward Contract	Futures Contract
Definition	A forward contract is an agreement between two parties to buy or sell an asset (which can be of any kind) at a pre-agreed future point in time at a specified price.	A futures contract is a 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	Standardized. Initial margin payment required. Usually used for



	required. Usually used for hedging.	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-	Opposite contract with same or different counterparty.	Opposite contract on the exchange.



termination Counterparty risk remains while terminating with different counterparty.

Market Primary & Secondary Primary



UNIT IV

HEDGING AND STOCK INDEX FUTURES

Hedging

Hedging in finance refers to protecting investments. A hedge is an investment status, which aims at decreasing the possible losses suffered by an associated investment. Hedging is used by those investors investing in market-linked instruments. To hedge, you technically invest in two different instruments with adverse correlation. The best example of hedging is availing of car insurance to safeguard your car against damages arising due to an accident.

Hedging is a financial strategy that investors should understand and use because of all the advantages it offers. As an investment, it preserves an individual's finances from being revealed to a risky situation that may lead to loss of value. Though, Hedging doesn't necessarily mean that the investments won't lose value at all. Instead, if it happens, the losses will be moderated by gains in another investment. Hedging is recognising the dangers of every investment and preferring to be protected from any untoward event that can impact an individual's finances. One obvious example of this is getting car insurance. In the case of a car accident, the insurance policy will undoubtedly shoulder at least part of the repair costs. Hedging does not prevent the investments from suffering losses, but it just reduces the extent of negative impact. Hedging is employed in the following areas:

Securities Market: This area includes investments made in shares, equities, indices, and so on. The risk involved in investing in the securities market is known as equity or securities risk.

Commodities Market: This area includes metals, energy products, farming products, and so on. The risk entailed in investing in the commodities market is referred to as the commodity risk.



Interest Rate: This area includes borrowing and lending rates. The risk associated with the interest rates is termed as the interest rate risk.

Weather: This might seem interesting, but hedging is possible in this area as well.

Currencies: This area comprises foreign currencies and has various associated risks such as volatility and currency risk.

Different types of Hedges

Hedging is broadly classified into three types that will help investors earn profits by trading different commodities, currencies, or securities. They are:

Forward Contract- It is known as a non-standardized agreement to buy or sell underlying assets at a set price on the date agreed by two independent parties involved. The forward contract covers various contracts like forwarding exchange contracts for currencies, commodities, etc.

Futures Contract- It is known as a standardized agreement to buy or sell underlying assets at a set price on the particular date and standardized quantity agreed by two independent parties involved. A futures contract includes various contracts like commodities, currencies, futures contracts, etc.

Money Markets- It is known as one of the principal components of financial markets where short term lending, borrowing, buying, and selling is achieved with the maturity of one year or less. It covers many forms of economic activities of currencies, calls on equities where short-term loans, money market operations for interest, borrowing, selling, and lending happen with a maturity of one year or more.



Hedging Strategies

There are several hedging strategies, and each one is different. Investors are encouraged not to use just one strategy but different ones for the best results. Below are some of the most basic hedging strategies that investors should consider:

Diversification– The saying that goes “don’t put all your eggs in one basket” never gets old, and it actually makes sense in finance as well. Diversification occurs when an investor puts his finances into investments that do not move in a uniform direction. Simply put, it is investing in a diversity of assets that are not at all related to each other so that if any one of these drops, the others may rise. For example, a businessman purchases stocks from a hotel, a private hospital, and a chain of malls. If an adverse event impacts the tourism industry where the hotel operates, the other investments won’t be affected because they are not related.

Arbitrage– The arbitrage strategy is straightforward yet very smart. It involves purchasing a product and selling it instantly in another market for a higher price; thus, making modest but steady profits. The strategy is most generally used in the stock market. Let’s take a simple example of a junior high school student buying a pair of shoes from the outlet store nearby for only Rs. 145 and then selling it to his schoolmate for Rs. 170. The schoolmate is pleased to get a much lower price than the department store, which sells it for Rs. 210.

Average down– The average down strategy involves buying extra units of a particular product even though the cost or selling price of the product has decreased. Stock investors often make use of this strategy of hedging their investments. If the price of a stock they’ve purchased earlier declines significantly, they buy more shares at a lower price.

Then, if the price rises to the point between their two buy prices, the profits from the second buy can offset losses in the first.



Staying in cash– This strategy is as easy as it sounds. The investor keeps a part of his money in cash, hedging against potential losses in his investments.

How do Investors Hedge

The AMC's generally employ the following hedging strategies to mitigate losses:

Asset Allocations: This is done by diversifying an investor's portfolio with various classes of assets. For instance, you can invest 40% in the equities market and the rest in stable asset classes. This balances your investments.

Structure: This is done by investing a certain portion of the portfolio in debt instruments and the rest in derivatives. Investing in debt provides stability to the portfolio while investing in derivatives protects you from various risks.

Through Options: This strategy includes options of calls and puts of assets. This facilitates you to secure your portfolio directly.

Advantages of Hedging

Following are the various advantages of Hedging:

- Futures and options are very good short-term risk-minimizing strategy for long-term traders and investors.
- Hedging tools can also be used for locking the profit.
- Hedging enables traders to survive hard market periods.
- Successful hedging gives the trader protection against commodity price changes, inflation, currency exchange rate changes, interest rate changes, etc.
- Hedging can also save time as the long-term trader is not required to monitor/adjust his portfolio with daily market volatility.
- Hedging using options provide the trader an opportunity to practice complex options trading strategies to maximize his return.



Disadvantages of Hedging

Following are the disadvantages of Hedging:

- Hedging involves cost that can eat up the profit.
- Risk and reward are often proportional to one other; thus reducing risk means reducing profits.
- For most short-term traders, e.g.: for a day trader, hedging is a difficult strategy to follow.
- If the market is performing well or moving sideways, then hedging offer little benefits.
- Trading of options or futures often demand higher account requirements like more capital or balance.
- Hedging is a precise trading strategy and successful hedging requires good trading skills and experience.

Perfect hedging

A perfect hedge is a position by an investor that eliminates the risk of an existing position, or a position that eliminates all market risk from a portfolio. Rarely achieved, a perfect hedge position needs to have a 100% inverse correlation to the initial position. Perfect hedge is often attempted by investors through a combination of options, futures, and other derivatives for defined periods rather than as ongoing protection. A common example of a near-perfect hedge is when an investor uses a combination of held stock and opposing options positions to insure against any loss in the stock position. The downside of this strategy is that it often limits the gain of the stock position.

Perfect Hedges in a Practical World

A perfect hedge is defined as an ideal hedge based on an investor's risk tolerance. Completely removing all risk from the investment has a similar impact on the potential for rewards. Instead, investors and traders look to establish a range of probability where the



worst and best outcomes are both acceptable.

Traders do this by establishing a trading band for the underlying investments in which they are trading. The band can be fixed or can move up and down. However, the more complex the hedging strategy, the more likely it is that the cost to hedge may impact overall profit. Investors in traditional securities experience see the same results. There are many strategies to hedge an investor's stocks through futures, call and put options, and convertible bonds, but they all incur a cost to implement. Investors try to create hedges through diversification. By finding assets with low correlation or inverse correlation, investors can ensure smoother overall portfolio returns. The cost of hedging is apparent as an investor ties up capital and pays transaction fees throughout the process of diversification.

Popular “Perfect” Hedges

Perfect hedges do exist in theory but are rarely worth the cost for any period except in the most volatile markets. Several types of assets are often referred to as the perfect hedge, a haven for capital in volatile markets. This list includes liquid assets like cash and short-term notes and investments like gold and real estate. These perfect hedges do not experience the volatility of the financial market and illustrate other places in which an investor can shelter cash.

Long Hedge

A long hedge refers to a futures position that is entered into for the purpose of price stability on a purchase. Long hedges are often used by manufacturers and processors to remove price volatility from the purchase of required inputs. These input-dependent companies know they will require materials several times a year, so they enter futures positions to stabilize the purchase price throughout the year. For this reason, a long hedge may also be referred to as an input hedge, a buyers hedge, a buy hedge, a purchasers hedge, or a purchasing hedge.



Understanding Long Hedges

A long hedge represents a smart cost control strategy for a company that knows it needs to purchase a commodity in the future and wants to lock in the purchase price. The hedge itself is quite simple, with the purchaser of a commodity simply entering a long futures position. A long position means the buyer of the commodity is making a bet that the price of the commodity will rise in the future. If the good rises in price, the profit from the futures position helps to offset the greater cost of the commodity. A long hedge is a type of hedging strategy that producers or manufacturers use to lower the risk of price fluctuations. A producer or manufacturer uses such a strategy to lock the price of a commodity or input that they wish to buy in the future. We can also call this hedge as input hedge or a buy hedge, or a purchaser hedge. In simple words, we can say that a long hedge is a strategy that a company uses to control its costs. Such a strategy is effective if a company knows that it will need a particular input or commodity in the near future. So there needs to be clarity with regard to the item, quantity of that item, time horizon, and the rising price outlook. When all these are clearly spelled out, then only the company can take a futures position to offset or mitigate the price rise risk.

Short hedge

A short hedge refers to strategy investors and companies can use to protect themselves from losses due to the anticipated or real decline in an asset they own or produce. A short hedge refers to strategy investors and companies can use to protect themselves from losses due to the anticipated or real decline in an asset they own or produce. Short hedging often involves selling a futures contract. For example, farmers sometimes do this to protect themselves against losses in the commodity they produce. Short hedge generally occurs when an investor purchases a put option for the asset they already have. You can also sell futures contracts to conduct a short hedge, but this is a relatively complicated strategy and not as relevant to individual investors.



How a Short Hedge Works

A common short hedge occurs when an investor purchases a put option alongside a stock they plan to hold for a long time. The put option acts as a sort of share-for-share insurance if your stock price goes down. In theory, the stock price dropping doesn't cost you any money.

Types of Short Hedges

Buying a put option (which indicates short sentiment) represents one way to hedge against downside. However, this strategy only works for individual stock positions. If you want to guard against the decline in value of your overall portfolio, you could use one or more of the following strategies.

General Market Index Put Options

One way to approach a short hedge is to purchase a put option on a general market index, such as the S&P 500 or Nasdaq, particularly if the composition of your portfolio closely resembles that of the index. However, it might be difficult for many individual investors to make this determination, rendering the position short one segment of the market instead of the original purpose of hedging against downside in your specific set of holdings. Additionally, during periods of considerable stock market volatility, put option premiums on these indices might be prohibitively expensive. This turns what you might have wanted to be a simple, straightforward hedge into an advanced strategy, given that it's difficult for many individual investors to assess volatility as it relates to the cost of an option contract.

Short Selling

You can hedge a long stock position by short selling the same stock. The problem with short selling, particularly for inexperienced investors, is that you could lose your entire investment. This is not possible when you purchase a put option. Your losses on a put option can go no higher than whatever it cost you to purchase the premium.



Inverse ETFs

To hedge against your portfolio or a set of holdings within your portfolio, you could purchase an inverse ETF. An inverse ETF aims to generate a return that's the inverse of the stock market index it tracks. For instance, generally speaking, an inverse S&P 500 ETF would increase in value as the actual S&P 500 decreases in value, or vice versa. Some inverse ETFs use leverage and look to return inverse performance that is multiples, say two or three times, of the index it tracks.

Cross hedging

Cross hedging in trading is a hedging strategy using two positively correlated assets. Traders must distinguish between the “what is cross hedging” definition and the difference between cross hedging, beta, and delta hedging. Traders must also understand the cross hedge vs. proxy hedge difference, especially in Forex. One easy way to differentiate them is that a proxy hedge requires two currencies, and the trader currency is not one of them. A cross hedge consists of three, including the trader currency. A higher correlation results in a more efficient hedge, but the relationship is not perfect. Therefore, a trader must accept the risk that both positions move in the opposite direction. Companies with massive inventory levels and traders with significant positions will use hedging to mitigate risk and lock in current prices when they expect a volatility rise or undesirable price action ahead. For example, jet fuel costs remain a substantial cost for airlines, and surging prices could result in unprofitable operations. Therefore, an airline can hedge its exposure by buying jet fuel futures or enter a cross hedge by buying crude oil futures. A cross hedge presents the next alternative with a high correlation ratio if the primary hedge is unavailable. Cross hedging is typically utilized by investors who purchase derivative products, such as commodity futures. By using commodity futures markets, traders can buy and sell contracts for the delivery of commodities at a specified future time. This market can be invaluable for companies that hold large amounts of commodities in inventory, or who rely on commodities for their operations.



When to Use Cross Hedging

Market participants use cross hedging when the desired asset is unavailable or thinly traded. For example, if an airline seeking to hedge jet fuel exposure cannot find jet fuel futures at the desired price, the closest alternative asset is crude oil futures. A high correlation ratio is essential for a cross hedge. The primary cross hedging risk is that the underlying asset and the hedge become unrelated, and price action for both moves in the opposite direction. It increases losses and unhedged the position. It is impossible to eliminate all associated trading risks. Over hedging is another risk, where the hedged position has a more significant impact than the underlying asset. Skilled traders may exit both positions at a profit or close the underlying asset at a profit and hedge the hedge, but everything circles back to conducting an in-depth and accurate market analysis. The rationale behind a cross hedge is that it allows an investor to occupy similar positions in two different markets. This is a unique strategy that helps investors hedge market volatility. Through cross hedging, an investor purchases two correlated financial instruments in which the overall risk or loss of one is offset by the profit earned on the other. Cross over coverage is similar to a cross hedge, it entails ensuring that two investments have a level of similarity despite that they are from two distinct markets with varying conditions. Crossover or cross hedging can also occur in businesses, this entails a business having two correlated investments that are both sensitive to market volatility in such a way that one investment gives protection to the other.

Hedging Objectives

In the prior discussion of hedging strategies, we have assumed the only objective of hedging is to minimize the risk, However, sometimes, the hedgers may be willing to assume more risk in order to earn more profit because eliminating all price risk will lead to eliminating the profit of the firm, which may not be good at all the time.



Thus, the hedgers may use such hedging ratio other than the minimum-variances hedge ratio, or willingly may go for under hedging. Undoubtedly the decision relating to hedging ratio or how much to hedge will depend upon the hedger's risk preference. The lesser he hedges, the more risk he assumes. Not only this, the hedger may change his hedging strategy later on due to his strong belief about the futures price movements. So hedging objective is a relative concept and much depends upon the risk and return. In other words, it is the trade off between profits and risk reduction through hedging because it is observed that risk could be reduced but at the cost of lost profits.

Management of the Hedge

After establishing a hedge, it is essential to manage it effectively. So regular monitoring and making adjustments are the key factors in managing of the hedge. There also needs to be a systematic evaluation of the effectiveness of the hedge relative to its anticipated (or excrete measure), Further, if the desired results are not being achieved from the hedging, then the reasons should be identified and necessary steps be taken to improve hedge effectiveness in the futures, To manage effectively the hedging, following steps are taken:

Monitoring the Hedge

Continuous monitoring on the performance of a hedging is essential. For this purpose, the following information should be available regularly on an up-to-date basis:

Cash Position

The hedger must get the information of the current size of the cash position being hedged.

What are the changes in its magnitude since the inception of hedge? What are the gains or losses on this position to date? What are the reasons of such deviation?. etc.

Futures Position

Likewise, cash position, the information regarding the size of futures position, profits and losses incurred to date on this position, etc., be collected for further consideration.



Margins

All such information concerning the margin like the total amounts of funds dedicated to margin requirements, net financing to-date, net costs to and further, the availability of funding arrangements to meet futures margin calls, etc. should be available continuously.

Basis Movements

All such information regarding the changes in basis should be collected to see whether they are consistent with a prior expectation or there are any major deviations at the particular time intervals.

New information

Sometimes, new waves occur in the market or there is new information regarding the underlying assets which cause to change in the prices either of the spot or futures must be noted and analyzed further to evaluate their impact on hedging strategy followed by the firm.

Index Futures

Index futures are contracts that allow a trader to purchase or sell a financial index today and have it resolved at a later date. Traders speculate on the price direction of an index, such as the S&P 500, using index futures. Index futures are also used by investors and investment managers to protect their stock investments from losses.

How do Index Futures Work?

Index futures, like all futures contracts, provide the trader or investor the power and responsibility to deliver the contract's cash value based on an underlying index at a future date. The trader is bound to provide the cash value on expiry unless the contract is unwound before expiration by an offsetting deal. An index is a measurement of the price of a single item or a collection of assets. Index futures are derivatives, which means they are based on an underlying asset (the index). Traders utilize these products to trade a wide range of assets, including stocks, commodities, and currencies. To bet on the index's appreciation or depreciation, an investor could buy or sell index futures on the S&P 500.



How to Trade Index Futures?

In index futures investing or trading, the buyer and seller lock purchase and sell bids. Both parties agree to close their holdings lawfully at a specific price and on a specific date. Traders' buy and sell orders are placed by a futures broker on their behalf. The next step is to create a long and short position for buy and sell orders, with initial and maintenance margins. The payment of futures contracts is entirely based on cash. On the expiration date, the seller and buyer can also pay and receive the difference in the agreed-upon contract price in cash. Simply said, a higher price results in a profit for the buyer, while a lower price results in a loss for the seller.

Types of Index Futures

Index futures are of several types, and they are mentioned below:

Nifty 50: 50 underlying securities make up the BSE's Sensitive Index or Sensex.

Nifty IT: Shares of information technology make up the underlying assets. The fortunes of these futures would depend on the performance of the overall sector.

S&P BSE Sensex: 30 underlying securities make up the BSE's Sensitive Index or Sensex.

Nifty Bank: Bank shares make up the index, so how the Nifty Bank futures would perform would depend on how well the banks are doing.

S&P BSE Bankex: The futures have banking stocks listed on the Sensex.

S&P BSE Sensex 50: This index is inclusive of 50 stocks instead of the 30 that make up the Sensex.

S&P BSE Bharat 22 Index: This index is made up of 22 central public sector enterprises.

Others: You could also trade in these futures from foreign stock exchanges.

Importance of the Index Futures

Due to a lack of cash to make large stock purchases, futures contracts are one of the most effective trading options. It's a derivative-based investment that allows traders to spend less while earning more. Furthermore, there are two methods for using equities or stock index futures:



Experienced traders can use futures contracts to bet on the future direction of an underlying asset or index. Simply put, it means that instead of buying or selling futures contracts, investors can wager on a group of assets by speculating on a bullish or bearish market. Traders must stay current with market developments in order to lock in successful positions when speculating. Many traders utilize futures contracts to hedge against losses incurred as a result of excessive stock price swings. When stock prices fall, investors with a stock portfolio or equity index options sell futures contracts to reduce their risk of losing money. Futures contracts gain value in this case, as opposed to stock prices falling.

Stock Index

Before discussing the concept of stock index futures, we should know about the term stock index. A stock index or stock market index is a portfolio consisting of a collection of different stocks. In others words, a stock index is just like a portfolio of different securities' proportions traded on a particular stock exchange like NIFTY S&P CNX traded on National Stock Exchange of India, the S&P 500 Index is composed of 500 common stocks, etc. These indices provide summary measure of changes in the value of particular segments of the stock markets which is covered by the specific index. This means that a change in a particular index reflects the change in the average value of the stocks included in that index. The number of stocks included in a particular index may depend upon its objective, and thus, the size varies index to index. For example, the number of stocks included in SENSEX is 30 whereas 500 stocks are covered in Standard and Poor's 500.

There are, however, some common features of these stock indices which are as under:
Common Features

1. A stock index contains a specific number of stocks, i.e., specification of certain sector number of stocks like 30, 50, 100, 200, 500 and so on.
2. Selection of a base period on which index is based. Starting value of base of index is set to large round like 100, 1000, etc.



3. The method or rule of selection of a stock for inclusion in the index to determine the value of the index.
4. There are several methods commonly used to combine the prices of individual stock like arithmetic average, weighted average, etc.
5. There are three types of index construction like price weighted index, return equally weighted index and market capitalization weighted index.
6. A stock index represents the change in the value of a set of stocks which constitute the index. Hence, it is a relative value expressed as weighted average of prices at a specific date. 290
7. The index should represent the market and be able to represent the returns obtained by a typical portfolio of that market.
8. A stock index acts as a barometer for market behaviour, a benchmark for portfolio performance. Further, it also reflects the changing expectations about the market.

Stock Index Futures

A stock index futures contract, in simple terms, is a futures contract to buy or sell the face value of a stock index. American Standard and Poor's 500 index, although recently there has been remarkable growth in the stock index futures trading all over the world. The changes of stock index futures prices are very similar to that of the underlying stock index. This has been observed by the various studies conducted in this respect. Comparing the returns on futures indexes and cash indexes, it has been found that there is very little difference between these two indexes. However, the volatility of the futures indexes is somewhat greater than the cash stock indexes. The Standard and Poor's 500 (S & P500) index is based on a portfolio of 500 different stocks: 400 industrials, 40 utilities, 20 transportation and 40 financials. The weights of the stocks in portfolio at any given time reflect the stock's total market capitalization. (Stock price x No. of shares outstanding). The index accounts for about 80 percent of market capitalization of all the stock listed on New York Stock Exchange.



Specification of Stock Index Futures Contracts

All the stock index futures contracts are traded on the specified stock exchanges. For example, Standard and Poor's 500 Futures contract has the following specifications

Standard and Poor's 500 futures contract specifications:

1. Contract : Standard and Poor's 500 index
2. Exchange : Chicago Mercantile Exchange
3. Quantity : \$500 times the S&P 500 index
4. Delivery months : March, June, September, December
5. Delivery specifications : Cash settlement according to the value of the index at the opening on the Friday after the last day of trading
6. Minimum price movements : 0.05 index points, or \$25 per contract

Stock Index Futures as a Portfolio Management Tool

Funds managers or money managers use stock index futures basically for three purposes; hedging, asset allocation and yield enhancement. These are discussed here in this section. First of all, we should know who need the stock index futures for using them as a hedging tool. All such investors, specifically managing a huge pool of funds or public funds like pension funds, mutual funds, life insurance companies, investment and finance companies, banks, endowment funds, public provident funds, etc. would like to reduce their 299 fund's exposure to a fall in stock values caused due to uncertainties about futures market developments. This can be done by selling the shares and repurchasing them at a later time, but this strategy is not so appropriate because it would incur substantial transaction costs. As a result, funds managers prefer to hedge with stock index futures instead of altering their portfolio structure, directly and repeatedly. Before proceeding to the discussion regarding hedging, one needs to understand some background on risks relating to stock investments and portfolio management.



There are two types of risks associated with holding a security:

1. Systematic risk
2. Unsystematic risk

All the stocks are exposed to such factors which are not controlled by the firm itself, these are called market risk factors like changes in the interest rates, inflation rates, government trade policies, economic activities, political factors, changes in tax laws and so on. Such risk is termed as market risk or systematic risk. On the other hand, unsystematic or firm specific risk is related to the particular firm or an industry. This risk can be diversified by having diversified portfolio of many shares. Market risk cannot be eliminated by diversification since each of the stock moves with the market to some degree. Thus, stock index futures can be used to hedge or manage this risk.

Measuring Market Risk

Beta is a measure of the systematic risk. It measures the sensitivity of the scrip (asset) vis-à-vis index movements. Beta (β) is defined as the Covariance (Cov.) between a stock's return and the return on the overall market divided by the variance (var) of return on the market.

Portfolio managers often buy equity index futures as a hedge against potential losses. If the manager has positions in a large number of stocks, index futures can help hedge the risk of declining stock prices by selling equity index futures. Since many stocks tend to move in the same general direction, the portfolio manager could sell or short an index futures contract in case stocks prices decline. In the event of a market downturn, the stocks within the portfolio would fall in value, but the sold index futures contracts would gain in value, offsetting the losses from the stocks. The fund manager could hedge all of the downside risks of the portfolio, or only partially offset it. The downside of hedging is that this reduces profits if the hedge isn't required. So if the investor from the previous section with a September futures contract shorts index futures and the market rises, the index futures decline in value.



Speculation and Stock Index Futures

After discussing the case of arbitrage and hedging, let us now consider the speculating with stock index futures. As we know that basic objective of the speculators is to earn super profit by going either bullish or bearish in the market. Index futures permits them an ideal instrument where the vagaries of individual stocks, settlement cycles, etc. do not have so much of an impact as they do on specific stock. The speculators can select a strategy where they can have a bullish view and go long on futures. Similarly, they can have a bearish view and go short in futures. Earlier before the stock index futures came into existence, the speculators had two alternatives. Firstly, they can select the liquid stocks which would move with the index so that they can take a position in them for the expected move. But this move would be too risky. Secondly, they can select the entire stocks as in the index and trade in all of them. The basic of liquid stocks may mimic the index to some extent but still individual stock variations will affect the returns, and moreover, it is too costly with high amount of commission, etc. But now with the introduction of stock index futures, such limitations mentioned are taken care of. Now the speculators can take up either long position on the contract, paying a small margin, and seek to ride the expected trend and vice-versa for the bearish view-sell short index contract and cover when the index falls lower.

Stock Index Futures Trading in Indian Stock Market

SEBI Board accepted the recommendations of Dr. L.C. Gupta Committee on May 11, 1998 and approved introduction of derivatives trading in India in the phased manner. The recommendation sequence was stock index futures, index options and options on stocks. The Board also approved the suggestive bye-laws recommended by the Committee for regulation and control of derivatives trading in India. As a result, both the stock exchanges, National Stock Exchange of India (NSE) and Bombay Stock Exchange of India (BSE) took the initiative to introduce futures trading in India. The brief particulars



of their products are given here as under.

NSE's N FUTIDX NIFTY (NIFTY)

The National Stock Exchange of India introduced futures named 'NIFTY' on June 12, 2000. The salient features of this instrument are

1. Name of the instrument is N FUTIDX NIFTY.
2. The underlying index S&P CNX NIFTY (NSE 500).
3. Contract size. The index futures will be quoted as per the underlying asset which means that it will quote just like the Nifty in points. The value of the contract (contract size), a multiplier of 200 is applied to the index. It means that the value of a contract will be (200x index value) on that particular date. The multiplier can be thought of as the market lot for the futures contract. This can be changed from time to time.
4. NSE has introduced three contracts for one month, two months and three months maturities. These contracts of different maturities may be called near month (one month), middle month (two months) and far month (three months) contracts. The month in which the contract will expire is called the contract month, for example, contract month of April 2003 contract will be April, 2003.
5. Expiry. Each contract would have a specific code for representation purpose on the system. All these contracts will expire on a specific day of the month and currently they are fixed for the last Thursday of the month. As soon as the near month contract expires, middle contract will become near and so on.
6. Tick size/price step. Tick size is the minimum difference between two quotes of similar nature. Since the index futures would be traded in term of index points, the tick size is to be defined in points only. The Nifty tick size is ` 0.05 which will be converted into points.
7. Position limits. Present, both types of contracts as for speculation and hedging purposes are allowed to be traded. However, these are subject to change from time to time.
8. Trading hours. Trading hours are 10.30 a.m. to 3.30 p.m.



9. Margins. NSE fixes the minimum margin requirements and price limits on daily basis which are subject to change periodically.

10. Settlement. Position remaining open at the close of business on the last day of trading are marked-to-market according to the official opening level of the NSE-NIFTY on the following day. There is daily settlement also on the closing of futures contract.

11. Volumes and open interest. Futures contracts have a unique way of reporting volumes and it is called open interest. It provides the information about the number of outstanding/unsettled positions in the market as a whole at a specific point of time. In the futures market, total long positions would be equal to the total short positions, hence, only one side of the contracts are counted for determining the open interest position. Major stock exchanges of the world publish the open interest position regularly

BSE's BSX

The Bombay Stock Exchange introduced stock index futures trading on June 9, 2000 with the name of the instrument as BSX with the underlying BSE Sensitive Index (SENSEX). The features regarding its trading are more or less same with the NSE's NIFTY index futures. A few important features are given in brief here as under:

1. Date of start June 9, 2000
2. Security name BSX
3. Underlying security BSE Sensitive Index (SENSEX)
4. Contract size Sensex value x 50
5. Tick size 0.1 point of Sensex (equivalent to ` 5)
6. Minimum price fluctuation ` 5
7. Price band Not applicable
8. Expiration months Three months
9. Trading cycle A maximum of three months, the near month, next month and far month
10. Last trading day/Expiry day Last Thursday of the month or the preceding trading day.



Cross hedges and Changing Volatilities of an Asset Position

A cross hedge occurs if the characteristics of the cash asset underlying the futures contract differs from the cash instrument being hedged. A number of factors affect the degree of a cross hedge for a given position. The extent of a stock portfolio cross hedge is affected by the relative stock composition and relative stock weights of the cash and futures positions; any differences in the size between the cash and futures positions also affect the hedge. For a T-bond futures hedge one must consider the effect of the coupon, the time to maturity of the cash position, whether the bond possesses default risk, and the relative size of the underlying cash position. If any of these factors differ from the characteristics of the futures contract or the cheapest-to-deliver cash bond for pricing the futures, then a cross hedge exists. The extent of a cross hedge can be measured by the size of the correlation coefficient between the changes in value of the cash and futures position. The lower the correlation coefficient is the greater the difference in two positions. When a low correlation exists, the futures contract is not a good instrument to use for hedging purposes.



UNIT 5

FINANCIAL DERIVATIVES MARKETS IN INDIA

The individuals and the corporate sector units are freely using derivatives, also popularly known as future market instruments, in most of the developed countries of the world to manage different risks by the individuals and the corporate sector units. Emerged in 1970s, the derivatives markets have seen exponential growth and trading volumes have nearly doubled in every three years, making it a multi- trillion dollar business market. The future markets in various segments have developed so much that now one cannot think of the existence of financial markets without the derivatives instruments. In other words, the derivatives markets whether belonging to commodities or financials have become, today, an integral part of the financial system of a country. The Indian financial markets indeed waited for too long for derivatives trading to emerge. The phase of waiting is over. The statutory hurdles have been cleared. Regulatory issues have been sorted out. Stock exchanges are gearing up for derivatives. Mutual funds, foreign institutional investors, financial institutions, banks, insurance companies, investment companies, pension funds and other investors who are deprived of hedging opportunities now find the derivatives market to bank on. They would find very soon all other important derivatives instruments in the Indian financial markets to manage their portfolios and associated risks.

Need for Derivatives

Since 1991, due to liberalization of economic policy, the Indian economy has entered an era in which Indian companies cannot ignore global markets. Before the nineties, prices of many commodities, metals and other assets were controlled. Others, which were not controlled, were largely based on regulated prices of inputs. As such there was limited uncertainty, and hence, limited volatility of prices. But after 1991, starting the process of deregulation, prices of most commodities are decontrolled. It has also resulted in partly



deregulating the exchange rates, removing the trade controls, reducing the interest rates, making major changes for the capital market entry of foreign institutional investors, introducing market-based pricing of government securities, etc. All these measures have increased the volatility of prices of various goods and services in India to producers and consumers alike. Further, market determined exchange rates and interest rates also created volatility and instability in portfolio values and securities prices. Hence, hedging activities through various derivatives emerged to different risks. Futures' trading offers a risk-reduction mechanism to the farmers, producers, exporters, importers, investors, bankers, trader, etc. which are essential for any country. In the words of Alan Greenspan, Chairman of the US Federal Reserve Board, "The array of derivative products that has been developed in recent years has enhanced economic efficiency. The economic function of these contracts is to allow risks that formerly had been combined to be unbundled and transferred to those most willing to assume and manage each risk components." Development of futures markets in many countries has contributed significantly in terms of invisible earnings in the balance of payments, through the fees and other charges paid by the foreigners for using the markets. Further, economic progress of any country, today, much depends upon the service sector as on agriculture or industry. Services are now backbone of the economy of the future. India has already crossed the roads of revolution in industry and agriculture sector and has allowed the same now in services like financial futures. India has all the infrastructure facilities and potential exists for the whole spectrum of financial futures trading in various financial derivatives like stock market indices, treasury bills, gilt-edged securities, foreign currencies, cost of living index, stock market index, etc. For all these reasons, there is a major potential for the growth of financial derivatives markets in India.

Evolution of Derivatives in India

Commodities futures' trading in India was initiated long back in 1950s; however, the 1960s marked a period of great decline in futures trading. Market after market was closed usually because different commodities' prices increase was attributed to speculation on these markets. Accordingly, the Central Government imposed the ban on trading in derivatives in



1969 under a notification issue. The late 1990s shows this sign of opposite trends—a large scale revival of futures markets in India, and hence, the Central Government revoked the ban on futures trading in October, 1995, The Civil Supplies Ministry agreed in principle for starting of futures trading in Basmati rice, further, in 1996 the Government granted permission to the Indian Pepper and Spice Trade Association to convert its Pepper Futures Exchange into an International Pepper Exchange. As such, on November 17, 1997, India's first international futures exchange at Kochi, known as the India Pepper and Spice Trade Association—International Commodity Exchange (IPSTA-ICE) was established. Similarly, the Cochin Oil Millers Association, in June 1996, demanded the introduction of futures trading in coconut oils. The Central Minister for Agriculture announced in June 1996 that he was in favour of introduction of futures trading both domestic and international. Further, a new coffee futures exchange (The Coffee Futures Exchange of India) is being started at Bangalore. In August, 1997, the Central Government proposed that Indian companies with commodity price exposures should be allowed to use foreign futures and option markets. The trend is not confined to the commodity markets alone, it has initiated in financial futures too.

The Reserve Bank of India set up the Sodhani Expert Group which recommended major liberalization of the forward exchange market and had urged the setting up of rupee based derivatives in financial instruments. The RBI accepted several of its recommendations in August, 1996. A landmark step taken in this regard when the Securities and Exchange Board of India (SEBI) appointed a Committee named the Dr. L.C. Gupta Committee (LCGC) by its resolution, dated November 18, 1996 in order to develop appropriate regulatory framework for derivatives trading in India. While the Committee's focus was on equity derivatives but it had maintained a broad perspective of derivatives in general.

The Board of SEBI, on May 11, 1998, accepted the recommendations of the Dr. L.C. Gupta Committee and approved introduction of derivatives trading in India in the phased manner. The recommendation sequence is stock index futures, index options and options on stocks. The Board also approved the 'Suggestive Bye-Laws' recommended by the Committee for regulation and control of trading and settlement of derivatives contracts in India.



Subsequently, the SEBI appointed J.R. Verma Committee to look into the operational aspects of derivatives markets. To remove the road-block of non-recognition of derivatives as securities under Securities Contract Regulation Act, the Securities Law (Amendment) Bill, 1999 was introduced to bring about the much needed changes. Accordingly, in December, 1999, the new framework has been approved and 'Derivatives' have been accorded the status of 'Securities'. However, due to certain completion of formalities, the launch of the Index Futures was delayed by more than two years. In June, 2000, the National Stock Exchange and the Bombay Stock Exchange started stock index based futures trading in India. Further, the growth of this market did not take off as anticipated. This is mainly attributed to the low awareness about the product and mechanism among the market players and investors. The volumes, however, are gradually picking up due to active interest of the institutional investors.

Major Recommendations of Dr. L.C. Gupta Committee

Major recommendations made by the Dr. L.C. Gupta Committee on the introduction of derivatives markets in India are as under:

1. The Committee is strongly of the view that there is urgent need of introducing of financial derivatives to facilitate market development and hedging in a most cost efficient way against market risk by the participants such as mutual funds and other investment institutions.

2. There is need for equity derivatives, interest rate derivatives and currency derivatives.

3. Futures trading through derivatives should be introduced in phased manner starting with stock index futures, which will be followed by options on index and later options on stocks. It will enhance the efficiency and liquidity of cash markets in equities through arbitrage process.

4. There should be two-level regulation (regulatory framework for derivatives trading), i.e., exchange level and SEBI level. Further, there must be considerable emphasis on self regulatory competence of derivative exchanges under the overall supervision and guidance of SEBI.



5. The derivative trading should be initiated on a separate segment of existing stock exchanges having an independent governing council. The number of the trading members will be limited to 40 percent of the total number. The Chairman of the governing council will not be permitted to trade on any of the stock exchanges.

6. The settlement of derivatives will be through an independent clearing Corporation/ Clearing house, which will become counter-party for all trades or alternatively guarantees the settlement of all trades. The clearing corporation will have adequate risk containment measures and will collect margins through EFT.

7. The derivatives exchange will have on-line-trading and adequate surveillance systems. It will disseminate trade and price information on real time basis through two information vending networks. It should inspect 100 percent of members every year.

8. There will be complete segregation of client money at the level of trading/clearing member and even at the level of clearing corporation.

9. The trading and clearing member will have stringent eligibility conditions. At least two persons should have passed the certification programme approved by the SEBI.

10. The clearing members should deposit minimum ` 50 lakh with clearing corporation and should have a net worth of ` 3 crore.

11. Removal of the regulatory prohibition on the use of derivatives by mutual funds while making the trustees responsible to restrict the use of derivatives by mutual funds only to hedging and portfolio balancing and not for speculation.

12. The operations of the cash market on which the derivatives market will be based, needed improvement in many respects.

13. Creation of a Derivation Cell, a Derivative Advisory Committee, and Economic Research Wing by SEBI.

14. Declaration of derivatives as 'securities' under Section 2 (h) of the SCRA and suitable amendments in the notification issued by the Central Government in June, 1969 under Section 16 of the SCRA. The SEBI Board approved the suggested Bye-Laws recommended by the L.C. Gupta Committee for regulation and control of trading and settlement of derivatives contracts.



Explanation of Some Important Terms Used in the Committee's Recommendations

Derivatives Concept

A derivative product, or simply 'derivative', is to be sharply distinguished from the underlying cash asset. Cash asset is the asset which is bought or sold in the cash market on normal delivery terms. Thus, the term 'derivative' indicates that it has no independent value. It means that its value is entirely 'derived' from the value of the cash asset. The main point is that derivatives are forward or futures contracts, i.e., contracts for delivery and payment on a specified future date. They are essentially to facilitate hedging of price risk of the cash asset. In the market term, they are called as 'Risk Management Tools'.

Financial Derivatives – Types Though the Committee was mainly concerned with equity based derivatives but it has tried to examine the need for derivatives in a broad perspective for creating a better understanding and showing inter-relationship. Broadly, there are three kinds of price risk exposed to a financial transaction, viz.

1. Exchange rate risk, a position arisen in a foreign currency transaction like import, export, foreign loans, foreign investment, rendering foreign services, etc.
2. Interest rate risk, as in the case of fixed-income securities, like treasury bond holdings whose market price could fall heavily if interest rates shot up
3. Equities', 'market risk', also called 'systematic risk'—a risk which cannot be diversified away cause the stock market as a whole may go up or down from time to time.

The above said classification indicates towards the emergence of three types of financial derivatives namely currency futures, interest rate futures and equity futures. As both forward contracts and futures contracts can be used for hedging, but the Committee favours the introduction of futures wherever possible. Forward contracts are presently being used in India to provide forward cover against exchange rate risk. Currency and interest rate futures lie in the sphere of Reserve Bank of India (RBI).



The Dr. L.C. Gupta Committee recognizes that the basic principles underlying the organization, control and regulation of markets of all kinds of financial futures are the more or less same and that the trading infrastructure may be common or separate, partially or wholly. The Committee is of further opinion that there must be a formal mechanism for coordination between SEBI and RBI in respect of financial derivatives markets so that all kinds of overlapping of jurisdiction in respect of trading mechanism, be removed. Financial derivatives markets in India have been developed so far in three important instruments like equity, interest and currency. First one is regulated by the SEBI, whereas other two are controlled by the RBI. The markets of these instruments are in their preliminary stage.

Equity Derivatives

Dr. L.C. Gupta Committee considered in its study both types of equity like stock index derivatives and individual stocks derivatives. At the international level, stock index derivative is more popular than the individual stock. The Committee found in its survey that index futures are more preferable than individual stock from the respondents. The order of over-all preference in India as per the survey of the Committee, was as follows: (i) Stock index futures, (ii) Stock index options, (iii) Individual stock options and (iv) Individual stock futures.

Basic Reasons for the Preference of Stock Index Futures

Not only in India, in other countries too, is stock index futures most popular financial derivatives due to the following reasons:

1. Institutional investors and other large equity holders prefer the most this instrument in terms of portfolio hedging purpose.
2. Stock index futures are the most cost-efficient hedging device whereas hedging through individual stock futures is costlier as observed in other countries.
3. Stock index futures cannot be easily manipulated whereas individual stock price can be exploited more easily in India it is rather easier to play this game as witnessed in the past scams.



4. This is in fact that due to a limited supply of an individual stock, supply can easily be cornered even in large companies in India like Reliance Industries, State Bank of India, etc. The Management of these companies has complained many times about their share prices being manipulated by some interested parties. On the other hand, the supply of stock index futures is unlimited, and hence, the possibility of cornering is ruled out. In fact, the manipulation of stock index futures can be possible only if the cash prices of each component securities in the index be influenced, which is rare and not so high.

5. It is observed from the experiences of other countries that stock index futures are more liquid, more popular and favourable than individual stock futures. The same is also witnessed by the L.C. Gupta Committee in its survey from the responses of the respondents.

6. Since, stock index futures consists of many securities, so being an average stock, is much less volatile than individual stock price. Further, it implies much lower capital adequacy and margin requirements in comparison of individual stock futures.

7. In case of stock index futures trading, there is always clearing house guarantee, so the chances of the clearing house going to be bankrupt is very rare, and hence, it is less risky.

8. Another important reason is that in case of individual stocks, the outstanding positions are settled normally against physical delivery of the shares. Hence, it is necessary that futures and cash prices remained firmly tied to each other. However, in case of stock index futures, the physical delivery is almost impractical, and they are settled in cash all over the world on the premise that index value, as independently derived from the cash market, is safely accepted as the settlement price.

9. Lastly, it is also seen that regulatory complexity is much less in the case of stock index futures in comparison to other kinds of equity derivatives.

In brief, it is observed that the stock index futures are more safer, popular and attractive derivative instrument than the individual stock. Even in the US market, the regulatory framework does not allow use of futures on the individual stocks. Further only very few countries of world, say one or two, have futures trading on individual stock.



Strengthening of Cash Market

The Dr. L.C. Gupta Committee observed that for successful introduction of futures market in any country, there must be a strong cash market because derivatives extract their value from the cash asset. The constant feedback between these two markets through arbitrage will keep these markets in alignment with each other. The Committee noted certain weaknesses of the Indian equities markets which should be taken care for success of the futures trading in India. A few important weaknesses observed are as under:

Mixing of Cash and Forward Transactions

1. There is queer mixture of cash and future transactions in the Indian stock markets. For example, cash transactions (involving delivery), in most active scripts, deliveries are just around 5 per cent of the trading volume whereas in many others, it is just, 20-30 percent. In fact, the dominant cash transactions are the non-delivery which are the equivalent of futures/forward transactions.

2. It is further noted that the above said mixed system (cash-cum-carry forward) is not very sound for futures trading because (i) no transparency in the carry forward system, (ii) the influence of fundamental factors is not so strong due to dominance of short term speculation and (iii) creating a future market on such basis may have the effect of compounding the existing weaknesses.

3. The Committee is of the view that there must be separation between cash market and futures market. It will promote the markets economic efficiency. This has led to the adoption of the rolling settlement system because in this way, cash market will function as genuine cash markets but no carry forward. Even futures market does not permit carry forward from one settlement to another in the way practiced in India.

4. The trading in Indian stock market was shifted to rolling settlement recently where always emphasized for settlement by delivery. But in India, 'squaring up or closing' business (i.e. offsetting of buying and selling transactions within the settlement) is accounted for in bulk which is not appropriate for futures trading.



Differences in Trading Cycles Among Stock Exchanges

1. Indian stock exchanges, now, most of them, have a weekly trading cycle but the cycles are not uniform. For example, NSE has from Wednesday to Tuesday and BSE has from Monday to Friday. Due to difference in trading cycles, the brokers who have membership in both the exchanges can easily go on circulating their trades from one exchange to the other without ever having to delivery. Such situation is a complete travesty of the cash market and an abuse to the stock market system.

2. It seems that in Indian stock markets, the different trading cycles have been kept with a vested interest in order to deliberately generate arbitrage opportunities, it is seen that due to this, the prices for the same securities on two (NSE and BSE) stock exchanges differ from 0.5 to 1.5 percent even it is larger on expiration days. The Committee feels that the different cycles serving the interest of only speculators and not of genuine investors. Even it is not good for market development and futures trading.

3. It is also noted, that the prices of various securities on both exchanges (NSE and BSE), sometimes are not the same. As a result, the value of the stock indices on both the exchanges will not be same, if computed separately from the NSE and BSE prices. This will create a problem in valuation of future market stock.

4. The Committee also noted that for a successful future trading, a coordinated but pro-competitive nationwide market system be achieved. So it is suggested that before implementing a uniform trading cycle system among all exchanges, till such time the rolling settlement system can be adopted. This system will provide 'a sound and reliable basis for futures trading in India.

Weakness of Stock Exchange Administrative Machinery

The Dr. L.C. Gupta Committee members were of the strong opinion that for successful derivatives trading on the stock exchanges, there must be stringent monitoring norms and match higher standard of discipline, than in the present, be maintained. Though the SEBI has already made a good effort but much more still is to be done specifically in the controlling



of trading members.

Inadequate Depository System

The Committee is of the view that all such securities which are composing in stock index and used for stock index futures, should necessarily be in depository mode. As observed earlier, settlement problems of the cash market may weaken the arbitrage process by making it risky and costly. Since, index based derivatives trading does not itself involve deliveries, it will increase the arbitrage trading between cash and index derivatives markets. The arbitrage process keeps the two markets in alignment. Thus, due to this reason, it is essential for successful futures trading that all the scripts of the particular stock index futures must be in the depository mode. Hence, depository scripts in India should be enhanced. The Committee has no doubt that the creation of futures markets by introducing the financial derivatives, including equity futures, currency futures and interest rate futures would be a major step towards the further growth and development of the Indian financial markets provided that the trading must be cost-efficient and risk hedging facilities.

Benefits of Derivatives in India

During December, 1995, the NSE applied to the SEBI for permission to undertake trading in stock index futures. Later SEBI appointed the Dr. L.C. Gupta Committee, which conducted a survey amongst market participants and observed an overwhelming interest in stock index futures, followed by other derivatives products. The LCGC recommended derivatives trading in the stock exchanges in a phased manner. It is in this context SEBI permitted both NSE and BSE in the year 2000 to commence trading in stock index futures. The question, therefore, becomes relevant—what are the benefits of trading in Derivatives for the country and in particular for choosing stock index futures as the first preferred product.



Following are some benefits of derivatives

1. India's financial market system will strongly benefit from smoothly functioning index derivatives markets.
2. Internationally, the launch of derivatives has been associated with substantial improvements in market quality on the underlying equity market. Liquidity and market efficiency on India's equity market will improve once the derivatives commence trading.
3. Many risks in the financial markets can be eliminated by diversification. Index derivatives are special in so far as they can be used by the investors to protect themselves from the one risk in the equity market that cannot be diversified away, i.e., a fall in the market index. Once the investors use index derivatives, they will suffer less when fluctuations in the market index take place.
4. Foreign investors coming into India would be more comfortable if the hedging vehicles routinely used by them worldwide are available to them.
5. The launch of derivatives is a logical next step in the development of human capital in India. Skills in the financial sector have grown tremendously in the last few years.

Categories of Derivatives Traded in India

1. Commodities futures for coffee, oil seeds, and oil, gold, silver, pepper, cotton, jute and jute goods are traded in the commodities futures. Forward Markets Commission regulates the trading of commodities futures.
2. Index futures based on Sensex and NIFTY index are also traded under the supervision of Securities and Exchange Board of India (SEBI).
3. The RBI has permitted banks, Financial Institutions (FI's) and Primary Dealers (PD's) to enter into forward rate agreement (FRAs)/interest rate swaps in order to facilitate hedging of interest rate risk and ensuring orderly development of the derivatives market.
4. The National Stock Exchange (NSE) became the first exchange to launch trading in options on individual securities. Trading in options on individual securities commenced from July, 2001.



5. Options contracts are American style and cash settled and are available in about 40 securities stipulated by the Securities and Exchange Board of India.

6. The NSE commenced trading in futures on individual securities on November 9, 2001. The futures contracts are available in about 31 securities stipulated by SEBI. The BSE also started trading in stock options and futures (both Index and Stocks) around at the same time as the NSE.

7. The National Stock Exchange commenced trading in interest rate future on June 2003. Interest rate futures contracts are available on 91-day 1-bills, 10-year bonds and 10-year zero coupon bonds as specified by the SEBI.

8. Table Calendar of Introduction of Derivatives Products in Indian Financial Markets.

Derivatives Trading at NSE/BSE

The most notable of development in the history of secondary segment of the Indian stock market is the commencement of derivatives trading in June, 2000. The SEBI approved derivatives trading based on futures contracts at National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) in accordance with the rules/bye-laws and regulations of the stock exchanges. To begin with, the SEBI permitted equity derivatives named stock index futures. The BSE introduced on 9 June, 2000 stock index futures based on the sensitive Index (also called SENSEX comprising 30 scripts) named BSX, and NSE started on June 12 2000 stock index future based on its index S&P CNX NIFTY (comprised 50 scripts) in the name of N FUTIDX NIFTY.

In India, stock index futures are available for one-month, two-month and three month maturities. All the open positions in these contracts are settled daily. Further, the buyers and sellers are required to deposit margin with the respective stock exchanges determined as per the SEBI guidelines. To facilitate the effective risk management in the derivatives segment, all the important measures like minimum net worth requirement for the broker, determination of margin based on value at risk model, position limit for various participants, mechanism for collection and enforcement of margin, etc. have been put in place.



Subsequently, the derivative products range had been increased by including options and futures on the indices and on several highly traded stocks. In an estimate, the product wise turnover of derivatives on the Indian stock markets as on July 6, 2002 is stock futures (50%), index futures (21%), stock options (25%) and index option (4%). It means stock futures are most popular derivative traded at the stock market of India.

During the last decade, to make stock market functioning effective for futures trading, the SEBI has adopted several internationally tested and accepted mechanism for implementation at the Indian stock exchanges. For this, proper surveillance and risk containment like the circuit breaker, price bands, value at risk (VaR) based margin collections, etc. have been introduced. The SEBI set up a 'Technical Group' headed by Prof. J.R. Verma to prescribe risk containment measures for new derivative products. The group recommended the introduction of exchange traded options on Indices which is also conformity with the sequence of introduction of derivatives products recommended by Dr. L.C. Gupta Committee.

The Technical Group has recommended the risk containment measure for exchange traded options on indices. The following are the important features of the risk containment framework for the trading and settlement of both index futures and index option contracts:

1. European style index options will be permitted initially. These will be settled in cash.
2. Index option contracts will have a minimum contract size of ` 2 lakh, at the time of its introduction.
3. The risk containment measures described hereunder are only for premium style European option.
4. Index option contract will have a maximum maturity of 12 months and a minimum of three strikes, i.e., in the money, near the money and out of the money.
5. A portfolio based margining approach, which would take an integrated view of the risk involved in the portfolio of individual client will be adopted. It is for the first time that such an approach is introduced in the Indian stock market. It is inconsistent with the practices



followed in the countries. This approach will not only cover the risk but also help in reducing the transaction costs in derivatives.

6. The initial margin requirements will be based on worst case loss of a portfolio of an individual client to cover a 99% value at risk (Va) over a one day horizon. The initial margin requirement will be netted at level of individual client and it will be on gross basis at the level of Trading/Clearing member. Further, the initial margin requirement for the proprietary position of Trading/Clearing member will also be on net basis.

7. The short option minimum margin equal to 30% of the Notional value of all short index option will be charged if sum of the worst scenario loss and the calendar spread margin is lower than the short option minimums margin.

8. Net option value will be calculated on the current market value of the option times the number of options (positive for long options and negative for short options) in the portfolio. The net option value will be added to the Liquid Net Worth of the clearing member.

9. For option positions, the premium will be paid in by the buyer in cash and paid out to the seller in cash on T+ 1 day until the buyer pays in the premium due shall he deducted from the available Liquid Net Worth on a real time basis. In case of index futures contracts, the mark-to-market gains losses for index futures position will continue to be settled.

Contrary to international experience, the growth of derivatives market did not take off as anticipated. The value of trading has been low. This is mainly attributed to the low awareness about the products and mechanism of trading among the market players and investors. SEBI's technical group on new derivative products has recently examined this issue and recommended the following measures for the development of derivatives market:

1. The system of sub-brokers be used for increasing the volume of trading in this market.
2. Financial institutions and mutual funds be permitted to sell short in the cash market for facilitating the free arbitrage between cash and derivatives market. However, such short sale may be restricted to the extent of corresponding exposure in the derivative market.
3. Arbitrage between cash and derivatives markets will assist in better price discovery in both the markets.



Countries like USA, UK and Singapore have reaped considerably economic benefit from foreign participation in their futures markets. Foreign participation in futures markets hedge the potential to act as a substantial ‘invisible earner’ of foreign exchange. Earlier the SEBI and the RBI both were hesitant to allow the foreign institutional investors (FITs) for trading in the futures markets. However, recently the RBI has allowed FITs to trade in derivatives market subject to the condition that the overall open position of the FIT shall not exceed 100 percent of the market value of the concerned FII’s total investment. As per the recent notification of the Central Government, SEBI and RBI will jointly examine the issues concerning trading in financial derivatives by FIs and FII (s).

Eligibility of Stocks

The SEBI board has initially approved the introduction of single stock futures contract on 31 stocks on which option contracts have been introduced on BSE and NSE. A list of these has been given in Table. The Advisory Committee on Derivatives of the SEBI shall review the eligibility criteria for introduction of futures and options on any other stock from time to time.

Emerging Structure of Derivatives Markets in India

Derivatives markets in India can be broadly categorized into two markets namely; financial derivatives markets and commodities futures markets. Financial derivatives markets deal with the financial futures instruments like stock futures, index futures, stock options, index options, interest rate futures, currency forwards and futures, financial swaps, etc. whereas commodity futures markets deal with commodity instruments like agricultural products; food grains, cotton and oil; metals like gold, silver, copper and steel and other assets like live stocks, vegetables and so on.

Financial derivatives markets in India are regulated and controlled by the Securities and Exchange Board of India (SEBI). The SEBI is authorized under the SEBI Act to frame rules and regulations for financial futures trading on the stock exchanges with the objective to protect the interest of the investors in the market.



Further carry forward trading (Badla trading) is also regulated by the SEBI which is traded on the stock exchanges. Some of the other financial derivatives like currency options and futures and interest rate futures are controlled by the Reserve Bank of India (RBI). These are dealt on Over-the-Counter (OTC) markets. Financial futures on interest rate include both short-term interest rate and long-term interest rate forwards. Currencies include options and forwards. Since the RBI is the apex body to regulate currencies and interest rates in India, hence, financial derivatives relating to foreign currencies and interest rates are generally come under the RBI regulation. Major stock exchanges in India, under the regulation of the SEBI, trade in two kinds of futures products, namely equity and carry forwards. Equity futures include stock futures, index futures, stock options and index options. Currently these are traded on National Stock Exchange and Bombay Stock Exchange. Examples of such companies on which options and futures are available, e.g. ACC, SBI, CIPLA, HPCL, TELCO, GRASIM, Dr. Reddy, Lab, HLL, HDFC, Hero Honda, etc. Commodity futures markets are regulated in India by Forward Market Commission (FMC). The Commission is entrusted with to regulate commodities futures trading in India. Products like hessian, potatoes, pepper, cotton, etc. are traded on Coimbatore Commodity Exchange and Calcutta Commodity Exchange. Recently the Central Government has allowed futures trading on 54 new commodities of different categories to be eligible for trading on exchanges.

Foreign Exchange Management

Foreign exchange management begins with trading currencies to exchange goods and services overseas. International businesses convert overseas profits back into their domestic currency to spend at home. Meanwhile, consumers exchange domestic currency for foreign banknotes to buy overseas goods. These transactions occur within the foreign exchange markets, where networks of private individuals, banks and organized financial exchanges provide the infrastructure to trade international banknotes.

Foreign exchange occurs at rates that are associated with currency valuations. Foreign exchange rates describe the amount of one currency that must be given up to receive one unit



of another currency, and they tend to parallel the political and economic environment of a particular country. For example, domestic foreign exchange rates appreciate when the economy is strong and the currency is in high demand to buy the nation's stocks and real estate. Conversely, currency values fall amidst political and social instability. Foreigners generally liquidate business assets in war-torn nations that struggle with development.

Effective foreign exchange management requires you to preserve purchasing power by staying current on any events affecting rates and operating accordingly. You will exploit the buying power of high exchange rates to acquire overseas goods. Alternatively, low exchange rates are an opportunity to boost overseas sales, as your wares become relatively cheaper overseas.

Foreign Exchange Management Act, 1999 (FEMA) came into force by an act of Parliament. It was enacted on 29 December 1999. This new Act is in consonance with the frameworks of the World Trade Organisation (WTO). It also paved the way for the Prevention of Money Laundering Act, 2002 which came into effect from July 1, 2005. FEMA is a set of regulations that empowers the Reserve Bank of India to pass regulations and enables the Government of India to pass rules relating to foreign exchange in tune with the foreign trade policy of India.

Main Features of Foreign Exchange Management Act, 1999

- It gives powers to the Central Government to regulate the flow of payments to and from a person situated outside the country.
- All financial transactions concerning foreign securities or exchange cannot be carried out without the approval of FEMA. All transactions must be carried out through "Authorised Persons."
- In the general interest of the public, the Government of India can restrict an authorized individual from carrying out foreign exchange deals within the current account.
- Empowers RBI to place restrictions on transactions from capital Account even if it is carried out via an authorized individual.
- As per this act, Indians residing in India, have the permission to conduct a foreign



exchange, foreign security transactions or the right to hold or own immovable property in a foreign country in case security, property, or currency was acquired, or owned when the individual was based outside of the country, or when they inherit the property from individual staying outside the country.

Structure of FEMA.

- The Head Office of FEMA, also known as Enforcement Directorate, headed by the Director is located in New Delhi.
- There are 5 zonal offices in Delhi, Mumbai, Kolkata, Chennai, and Jalandhar, each office is headed by Deputy Director.
- Every 5 zones are further divided into 7 sub-zonal offices headed by Assistant Directors and 5 field units headed by Chief Enforcement Officers.

FOREIGN EXCHANGE MANAGEMENT STRATEGIES

Foreign exchange risks include lost profits and purchasing power related to adverse currency movements. Canadian businessmen that hold reserves of Japanese yen suffer when the yen falls. Alternatively, Canadian exporters lose out on sales when Canadian dollars strengthen and make their goods more expensive for foreign buyers.

Foreign exchange risk management calls for diversification. Large corporations expand multinationally to balance currency risks. For example, elevated energy costs benefit resource-rich nations and currencies, while industrialized energy importers are subject to recession and inflation. Caterpillar is a multi-national corporation whose profits in oil-rich Russia may exceed any lost sales in America at that point.

Smaller investors that lack the finances to set up multinational enterprises can diversify accordingly with global or international mutual funds. Both types of funds consist of a portfolio of securities from many different countries, minimizing the risks associated with an economic downturn or currency devaluation in any one country.



Foreign Exchange Management Act (FEMA) vs Foreign Exchange Regulation Act (FERA)

Foreign Exchange Regulation Act (FERA)	Foreign Exchange Management Act (FEMA)
Parliament of India passed the Foreign Exchange Regulation Act in 1973	Parliament of India enacted the Foreign Exchange Management Act (FEMA) on 29 December 1999 replacing FERA.
FERA came into force from January 1, 1974.	FEMA came into force from June 2000.
FERA was repealed in 1998 by Vajpayee Government	FEMA succeeded FERA
FERA has 81 sections	FEMA has 49 sections
FERA was conceived with the notion that Foreign Exchange is a scarce resource.	FEMA was conceived with the notion that Foreign Exchange is an asset.
FERA rules regulated foreign payments.	FEMA focused on increasing the foreign exchange reserves of India, focused on promoting foreign payments and foreign trade.
The objective of FERA was conservation of Foreign Exchange	The objective of FEMA is Management of Foreign Exchange
The definition of “Authorized Person” was narrow.	The definition of “Authorized Person” was widened
Banking units did not come under the definition of Authorized Person.	Banking units came under the definition of Authorized Person.
If there was a violation of FERA rules, then it was considered as Criminal offence.	If there was a violation of FEMA rules, then it is considered as civil offence
A person accused of FERA violation was not	A person accused of FEMA violation will



provided legal help.	be provided legal help.
There was no provision for Tribunal, the appeals were sent to High Courts	There is provision for Special Director (Appeals) and Special Tribunal
For those guilty of violating FERA rules, there was provision for direct punishment.	For those guilty of violating FEMA rules, they have to pay a fine, starting from the date of conviction, if the penalty is not paid within 90 days, then the guilty will be imprisoned.
If there was a need for transferring of funds for external operations, then prior approval of the Reserve Bank of India (RBI) is required.	For External trade and remittances, there is no need for prior approval from the Reserve Bank of India (RBI).
There was no provision for IT	There is provision for IT



Prepared by

Dr. Vishnu .S MCom,MBA,MPhil, PhD
Assistant Professor, Department of Commerce
Manonmaniam Sundaranar University
Tirunelveli-12, Tamilnadu
Mail: vishnusreekumar697@gmail.com

Manonmaniam Sundaranar University, Directorate of Distance & Continuing Education, Tirunelveli