

INTRODUCTION TO DERIVATIVES

Unit Structure

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1.1 INTRODUCTION

INTRODUCTION OF RISK MANAGEMENT:

Risk is inherent in all the activities we perform in our day today life and all of us remain concerned about it. Risk can be defined as a deviation of the actual research from the expected. We all would like to eliminate this risk altogether and to live in a world of uncertainty. However complete elimination of risk is impossible but certain steps can be taken to mitigate raised to consider a considerable extent. Example when we buy an insurance policy against the theft in the house or for a vehicle version or attempting to minimize the potential loss that we may incur upon theft.

The magnitude of risk is normally estimated from the following two factors : (1) the probability of an adverse event happening; (2) guess the event occurs the magnitude of the lost it can cause.

The measures mitigate risks are determined by the combined impact of the probability and magnitude of loss. Therefore, from the perspective of its management risk can be viewed into two ways, (1) risk of small losses with high probability (2) risk of high losses with low probability. The first category of all the changes in the stock prices, commodity prices where the changes are small but occur frequently. In the second category or earthquake, tsunami, theft etc. which cause huge losses but probability of their occurrence is far lower even though the expected loss in the two categories may be same, the strategies of risk management would differ.

In business enterprises the management of risk is mainly confined to situations of high probability of small losses. The management of other kind of risk of low probability of large losses or more strategic in nature such as capital budgeting decisions. The tool of handling such risk from different subject. With derivatives we turn our focus on the management of the risk that emanate from conduct of normal operation of the business that is risk of small losses with probability of it being large.

1.2 MANAGING RISK:

There are various ways in which different people manage different kinds of risk. Insurance policy is a classic example of managing risk with which we all are familiar. One possible way to avoid risk is not to undertake an activity at all. There are people who abstain from air travel because they see to great risk with such a mode of transport. Likewise certain people do not invest in equity market due to risk associated with the stock market and prefer to invest in safer avenues. While certain activities can be avoided purely on the ground of high risk and one can still live without it like not investing in the equity market. It may not be possible to abstain from mandatory activities. Not to enter into business at all to avoid business risk is not a solution to the problem. Instead, it is a problem in itself. One has to find out better avenues to manage risk rather than avoidance of activity together. Another possible way to manage risk is to control potential damage. Once we decide to own a vehicle for personal use we observe speed control and traffic rules to avoid damage to life and property. As another major of managing risk, we can buy an accident insurance policy. Similarly, firms can protect against losses by buying a suitable loss of profit insurance. Yet another way of managing this is to defuse the risk across source of risk many call centres prefer to have multi location operation to protect against natural disasters. We all are too familiar risk diversification through portfolio management investor prefers to have investment in many alternative securities to protect themselves against fall in expected return from single investment the risk of failure of many investments simultaneously is far less than the risk of failing of single investment. Likewise firm do not have single supplier or single customer to manage business. They prefer to have many suppliers or customers as all of the suppliers do not fail to deliver at the same point of time or all customers cannot be weaned away by competitors. One can manage this by transferring it to another party who is willing to assume risk. Insurance companies do not do anything to content that is per say but assume risk on your behalf. They have no means of controlling theft, flood, earthquake, riots etc. but offer insurance against this risk. It is a business of the insurance company to assume such a risk as it earns an income. Similarly, there are people who are willing to assume risk of other kind for consideration. Are used as such does not and cannot vanish but get transferred from one who wants to avoid it and one who is willing to accept the risk upon exchange of consideration.

Here we shall discuss the various kinds of risk that a business enterprise is likely to face and the ways of managing the same. Their existence wide array of financial instruments and financial market that enable business enterprise is content this inherent in their day-to-day operations. We concentrate here on risk that have high probability of small losses and ignore other kind of risk. Non-financial risk such as financial loss due to certain key employee leaving an organisation, failure of research and development department to develop a product, breakdown of production machine, losses due to vagaries of nature, are not in the scope of discussion. Though there could be some mechanism to control or mitigate

such risks, there does not exist a free market where the instruments providing protection can be freely traded amongst participants.

1.3 TYPES OF BUSINESS RISK:

(1) **Price Risk:** all market be it of commodity, stock or material or dynamic. The forces of demand and supply very continuously though striving for equilibrium the prices are never stable. The price of commodities, share industrial products are subject to continuous change this change in price causes the profit of business enterprise to change which is cause of anxiety for managers of the firm. The the investors also face the same situation when they invest in financial securities, the prices of which vary causing uncertainty of returns. The risk of change in price can be mitigated or kept within the acceptable limits with the help of financial instruments specifically device for the purpose.

(2) **Exchange Rate Risk:** Exchange rate risk derived from the transaction denominated in foreign currency where a firm or an individual faces uncertainty regarding the exchange rate at which foreign currency will be converted in the domestic currency or vice versa. As an example let us consider a firm selling goods on credit and realizing the sale proceeds in a foreign currency. Even though the price in foreign currency is frozen, the firm faces and uncertainty regarding the amount that will be realized in domestic currency depending upon the rate prevailing at the time of realization of sales and its conversion to domestic currency. Likewise an importer having to pay in foreign currency at a later date would be uncertain about the actual amount to be paid in domestic currency. The risk of variation in exchange rate or manage through specific financial instruments such as futures, options and swap on foreign currency.

(3) **Interest Rate Risk:** like the changes in the prices and exchange rate the interest rate to keep changing depending upon various macro-economic factors both national and international all forms that need capital, resort to borrowing while those surpluses invest their funds. Both the borrowers and lenders face the risk of changes in the interest rate subsequent to the transaction. These risk can be hedged through tailor made or standard financial products.

DERIVATIVES:

The three kinds of rules describe in the preceding section can be managed through products that are classified as derivatives. They are best suited to manage risk of small losses with high probability. Derivatives are arrangements that derive their values on the basis of some assets called underlying assets. Derivatives means that one that derives its value from the value of some other assets physical or notional. For example:- an Indian exporter is expecting to realise \$1000 in six months from now, he had price his product with a profit of Rs.2000 based on the current market price of dollar at 80. The actual money that will be realized by him in an Indian rupee will depend upon the exchange rate prevailing six months later, this rate is not known today, exporter expect Rs. 80,000 but may end up getting Rs. 79,000 if the exchange rate is Rs.79 six months later or if fortunate he may realise Rs.81 if exchange rate goes to Rs.81, if the rate happens to be 79 his profit will stand reduced to half by Rs.1000, though he cannot do much to control the price of dollar in the currency market

and hence his profit he can definitely take some measures to reduce the uncertainty of the exchange rate and consequential profit.

One of the ways he can reduce the uncertainty is to sell Dollar to party who needs them six months later and negotiate the exchange rate today, by doing so he would be assuring himself of differential definite cash flow and profit, such a contract will be called a forward contract, where the actual exchange of currency will take place later but at a price that is determined today. Of course the price at which this foreign contract will be negotiated will be dependent upon the current price of dollar, known as spot price. Since the price of the forward contract is determined or in other words, derived from the spot price in the foreign currency market surcharge contract is classified as derivatives. The spot price of foreign exchange on basis of which forward contract price will be is called underlying asset, beside the price of underlying asset there will be other factors that will influence the price of the forward contract. In the case of foreign-exchange forward contract the other factors influencing the price would be interest rate of the currencies involved in the transaction. Similarly, a forward contract can be negotiated for any commodity subject to legal constraint and feasibility.

DERIVATIVES PRODUCTS:

There is a wide meaning of instruments available as derivatives, each of the instruments is different in some respects or other, conceptually, operationally or in its uses. The derivative products are continuously evolving and can be categorized in various ways:-

- (1) **FORWARDS** are contracts where the buyer and seller agree to exchange the asset and its price at future date, at a price fixed in advance.
- (2) **FUTURES** are similar to forward contracts in terms of their pricing and conception, but operationally different from forward in terms of other features. It is also forward contract to be settled at future date. The shortest definition of future is that it is an exchange traded forward contract. The feature of future contracts are standardised in terms of quality, delivery dates, delivery venue, quality of the product etc. Unlike forward contracts which facilitate exchange-based trading.
- (3) **OPTIONS** are contracts for delivery in future like forwards and futures, except that one of the two parties involved holds an option whether to enforce the contract or not while the other party is obligated to perform at the option of the first party. Option is the right without an obligation to buy or sell an asset at predetermined price with a specified time interval.
- (4) **SWAPS** are arrangements between 2 parties to exchange a set of cash flows according to a predetermined method. For example, one party may pay a fixed rate of interest in exchange of receiving a variable rate of interest on a notional principal amount for specified intervals of time.

Based on the underlying assets the derivatives can be classified as follows

- (1) Commodities
- (2) Currencies
- (3) Interest rates
- (4) Equity shares
- (5) Indices
- (6) Credit
- (7) Weather

Yet another classification of derivatives can be based on the way they are traded, derivatives can further be grouped according to the market the year deal in :

(1) Over The Counter (OTC) Products: where the contract is directly entered between two mutually parties with the matching needs that are known to each other are called over the counter products. These contracts are specific to the parties involved and or not traded in the market, these contracts are customized to the requirement of counterparties and are normally settled by delivery of underlying asset, though there is a possibility of existing the obligation by entering into subsequent contract opposite to the first one. Forward contract is an OTC product that determine the foreign exchange markets. Swap is also an OTC product. If the product gives rise to another risk called counterparty risk concerned with the failure of one of the parties to the contract to honour the obligation undertaken. They also suffer with the disadvantages of finding matching parties, skewed pricing as 2 parties are not equally strong and difficult exit.

(2) Exchange Traded Products: other kind of derivatives namely the exchange traded products are traded on the organised exchanges where the buyer and seller did not to know each other, the exchange being the counterparty for both buyer and seller. They are standard products whose specifications are designed by the exchange authorities taking into consideration the characteristics of the underlying assets. Credit derivatives are free from counterparty risk, the transaction cost in exchange traded products are transparent and nominal while in case of OTC product the transaction costs are included in pricing. Investor can enter and exit from derivatives position very conveniently as trading take place continuously. Futures are traded only on exchange while options can be both exchange traded as well as OTC. Options on stock and in dices are mostly exchange traded while options on foreign exchange rates are mostly OTC. Swap remain and OTC product.

1.4 PARTICIPANTS IN DERIVATIVES MARKETS

The participants in the derivatives market can be broadly classified in three depending upon their motives.

(1) Hedgers: Hedger are those who enter into derivative contract with the objective of covering risk. Pramod growing wheat faces uncertainty about the price of this product produced at the time of the harvest similarly a flour mill needing a bit also faces uncertainty of price of input. Both the farmer and the flour Mill can enter into forward contract where the farmer agrees to sell his produce when harvested at predetermined price to the flour mill. The farmer apprehends price fall while the flour mill fears price rise. Put the parties face the price risk, forward contract would eliminate the price of price for both the

parties' forward contract is entered into with the objective of hedging against the price risk of being faced by the farmer as well as the flour mill. Participants in the derivatives markets are called hedgers.

(2) Speculators: Speculators are those who enter into a derivatives contract to make profit by assuming risk. We have independent view of future price behaviour of the underlying asset and take appropriate position in the derivatives with the intention of making profit later. For example, the forward price in US Dollar for contracts maturing in three months is Rs.80, if one believes that three months later the price of US dollar would be Rs.82, one would buy forward today and sale later. On the opposite, if one believes US dollar would depreciate to Rs. 78 in 3 months, one would sell now and buy later. Note that the intention is not to take delivery of underlying assets, but to make profit from differences in the currency prices.

(3) Arbitrageurs: The third category of participants that is arbitrators, perform the function of making the prices in different markets coverage and be in tandem with each other. While hedges and speculators want to eliminate and assume risk respectively, the arbitrators take risk less position and eight on profit. They are constantly monitoring the prices of different assets in different markets and identify opportunities to make profit that emanate from mispricing of products. For example, if the share price of listed company in NSE is Rs. 200 and Rs. 202 in BSE, the arbitrageur will buy at NSE and sell at BSE simultaneously and make the profit of Rs. 2 for the differences in prices.

1.5 FUNCTIONS OF DERIVATIVES MARKETS

(1) Enable Price Discovery:the derivatives and their market increases the competitiveness of the market as it encourages more number of participants with the wearing objectives of hedging, speculation and arbitrating with broad with broadening of the market the changes in the price of the product or watched by many who trade on the slightest of the reason, even a minor variation in price prompt action on the part of speculators, participation by large number of buyers and sellers ensures fair prices, the derivatives markets therefore facilitates price discovery of assets due to increased participants, increase volume and increase sensitivity of participants to react to smallest price change. By increase dipped in the market, faster and smooth dissemination of information among different participants the process of discovery of price becomes more efficient.

(2) Facilitate Transfer of Risk: hedges among them self could eliminate risk if two parties face risk from opposite movement of price. As seen earlier the weight farmer needing to sell his produce faced a rise from the fall in prices, while the flour mill needing to buy the weight was worried about the rising price. Since risk was deriving from opposite direction of price moment and the coverage of the two was possible. If the farmer and the flour mill wanted to hedge against the price rise the two would not meet when speculators enter the market they discharge an important function and help transfer of risk from those wanting to a limit to those wanting to assume risk.

(3) Provide Leveraging: Taking position in derivatives involves only fraction outlay of capital when compared with the opposition in the underlying asset in the spot market. Assume a speculator is convinced that price of wheat will be Rs.16 per KG in six months and farmer agrees to sell at Rs.15.50 per KG, to take advantage the speculator will have to pay the full price of Rs.15.5 per KG now and realised Rs.16 six months later, instead if a mechanism is available by which he can absorb himself of making the full payment, he will be to glad to enter into contract. Derivatives as a product and their market provides search exit route by letting him first enter into contract and then permitting him to neutralize position by Booking and opposite contract add later date, this magnifies the profit many folds with the same resources base, this also helps build volume of trade, further helping the price discovery process.



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FORWARDS AND FUTURES CONTRACTS

Unit Structure

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- 2.3 Features of Forward Contracts
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- 2.5 Future Contracts
- 2.6 Specification of a Future Contracts
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2.1 INTRODUCTION:

As described earlier derivatives or a contract that derive their value from the prices of underlying assets. The asset in question is called the underlying can be commodity such as wheat, rice silver etc. or financial products such as stocks, various currencies or hypothetical asset such as interest-rate, in dices etc.

Forwards and futures are the most common form of derivatives, these are contracts that specify price of the acid today but are settled at a later date. A settlement is referred to as extinguishment of obligation undertaken while initiating the contract. How to determine the price of an acid today that is to be delivered at a later date? Naturally this price would be depend upon the Price of the asset that is prevailing today called the spot market for underlying, hence the forward or future contract derives its price enter alia from the price of the underlying asset travelling today. The value of derivative fluctuates with the value of underlying asset the underlying assets can be commodity, metal, stop, currency, bond, index, treasury bills, a reference interest-rate or any other real or hypothetical asset.

2.2 FORWARD CONTRACT:

Forward contracts are all pervasive, knowingly or unknowingly we all enter into forward contract. In most cases we all acquire assets and pay the consideration for the same simultaneously. All transaction of cash or made on the spot, however in some cases we book purchased in advance and execute the delivery and its situation at a later point of time. Booking a movie ticket on phone is one such example. It is the sort of forward

contract because we buy the ticket now through there is a no formal written contract and pay its price only after reaching the cinema hall. Similarly most auto mobiles are booked in advance and the price is paid only upon the physical delivery of the vehicle. This is to is like a forward contract the asset and its purchases consideration is exchange at later date. A typical forward contract that is normally written an extent for a considerable time is a rent agreement for house or flat where fixed amount of rent is determined for a specific period of time usually a year. Every month the tenant pay a fixed amount of rent to the landlord that is determined at the given date. This essence of forward contract lies in the fixing of the price in advance, while the asset and its consideration in question or settled at later date.

2.3 FEATURES OF FORWARD CONTRACTS:

- 1. Two Parties :** Like any contract forward contract involves minimum two parties, buyer and a seller of an asset. The buyer of the contract is also referred to as long position while the seller is referred to as having taken a short position.
- 2. Over The Counter Product:** It is an OTC product where all relevant aspects of contract such as the asset, its quantity and quality and the price and delivery date are fixed on one to one basis customized to the needs of the parties involved. The buyer and the seller are in direct touch with each other.
- 3. Mutual Obligation to Perform:** On due date of the contract the seller makes the delivery of the acid and the buyer pays the price there is mutual obligation to perform by both the buyer and the seller. The seller is committed to make delivery on due date and the buyer is obligated to pay the consideration.
- 4. Counterparty Risk:** The buyer and seller of the contract assume risk, referred as counterparty risk on each other. The seller may fail to deliver the asset and or the buyer may fail to make the payment on agreed date. While entering the forward contract both contracting parties or aware of the possible default by the other party and take adequate precautions to prevent such default on either side. To mention here that upon maturity of forward contract only one and not both the parties would be having and advantageous position. The party in the losing situation is more likely to make a default.
- 5. Mutual Consent For Cancellation:** Once a forward is booked both parties or obligated to perform however the cancellation can only be done through mutual consent of both the parties at any time prior to the maturity of the contract. The feasibility and the terms and conditions of cancellation to may be decided in advance.
- 6. No Front-End Payment:** Exchange of money is done at the time of entering the forward contract through either party can insist on initial

deposit adjustable against the price and or delivery to mitigate counterparty risk.

2.4 SETTLEMENT OF FORWARD CONTRACTS:

Settlement refers to extinguishment of the obligations created under the forward contract, on the due date of the forward contract that is upon maturity there are two possible ways of settling the application:

(1) By Delivery of Asset and the Consideration : For example, if an exporter had sold Euro 10,000 to bank 6 months forward at say Rs. 66 per euro, then at maturity the contract would be settled by delivery of Euro 10,000 by the exporter to the bank who would pay Rs. 6,60,000/-

(2) By Entering into an offsetting contract opposite to the original contract at maturity or prior at a price prevailing then: For Example, the exporter having sold 6 months forward euro 10,000 at price Rs. 66 per euro, may after 3 months, decide to buy 3-month forward euro 10,000 at Rs. 67 per euro; of course, this is subject to the acceptance by the bank.

Settlement by delivery is where upon maturity of the contract period the buyer and seller discharge their mutual obligation. Settlement by cancellation is done by entering into an offsetting contract opposite to the date of initial contract. A buyer in the initial contract can sell the assets at new price P1 at any time prior to maturity or upon maturity to another party or to the original seller. Similarly the seller in the initial contract can buy the asset from any party prior or upon maturity at new price. However the obligation entered in the first contract state still would have to be discharge upon maturity, by cancellation the exchange then reduces to the differential of the prices of the original and offsetting contract. Settlement by cancellation may not be feasible for several reasons, in case a set in question is not readable, cancellation becomes a most impossible or delivery may be essential under law. Forward contracts are very common in foreign exchange markets. Exporters expecting to receive money in foreign currency cancel it forward while importers can buy foreign currency forward so as to meet their liability in future. Bank offers forward contract on various currencies to importers and exporters.

2.5 FUTURE CONTRACTS

Futures are relatively newer instruments as compare to forwards and classified as derivatives. Future contract is modified version of a forward contract but is fundamentally same as forward contract that is promising settlement on expiry having fixed the price today. However operationally there are substantial differences in the forward and future contracts.

Counterparty Risk: future contracts came into existence to overcome some of the problems that exist in the forward contract. In a forward contract there is a very strong inclination for at least one of the parties to default in fulfilling its commitment towards the party, pending upon the price in a row of the underlying asset at the time of settlement. One way of

eliminating the counterparty risk is to involve another party to the transaction. The forward contract is executed on a one-to-one basis and the two parties assume the counterparty risk. It can be easily visualize that one default will lead to chain reaction and the whole market may collapse with one default triggering another. This raised the issue of credibility of parties involved in the forward contract, unless both the parties are convinced about each other creditability the forward contract will not fructify. This will seriously limit the volume of trade in the forward market, as volume or inadequate the price cannot be said to be driven competitively, as a solution to the two parties in the forward contract court involved a third party in the contract that ensures performance of the contract, however locating the third-party acceptable to the both the buyer and the seller will be another task.

The Future Exchange: the issue of counterparty risk can be solved if the transaction is done on the exchange that serves as a counterparty to both the buyer and the seller. Rather than conducting business on one-to-one basis they do the business on the exchange. Both the buyer and the seller become liable to the exchange which in turn makes commitment to both, in case of default by one party they exchange meet the commitment from alternative sources. To protect itself the exchange can develop suitable risk containment measures with the exchange serving as a guarantor to both the buyer and the seller the contract or assured of the performance. This also eliminate the need for parties to know each other and the establish creditability before undertaking of forward deal. Call of the guarantor to ensure a default free execution can be performed by an organised body that is an exchange. Rather than settling the transaction to the both the buyer and seller can make their promise good to an exchange.

Standardised Contract / Product: However, if the trades have to take place on an exchange the product cannot be tailor made to the specific need of the two parties and instead would have to be standard. Exchange cannot commit itself to a quantity, quality and timing of the acid as per the specific requirement of the individual buyer and seller.

2.6 SPECIFICATION OF A FUTURE CONTRACTS:

(1) Underlying Asset: Futures being derivatives or price according to the asset on which it is written. Contracts are normally specified by the name of the underlying asset and month and year of the expiry of the contract for example future contract in rice at Multi Commodity Exchange note denoted as RICE DEC23 implies that contract is due for delivery in December 2023

(2) Contract Period: contract period relate to the time when contract expires. The exchange specifies when the contract for delivery in a particular month will come into force and when will it close for trading for example the gold contract will open for trading 12 months prior to the delivery month. The opening date and last date of trading will be specified by the exchange unlike forward where the delivery is as per the contract between the two parties, in future contract the delivery date is fixed by the

exchange. This has important implications in terms of period for which hedging can be done or speculative positions can be taken.

(3) Contract Size: Contract size or trading unit refers to the standard contract size that will be traded on the exchange each future for gold on NMCE is for 100 grams.

(4) Price Quotation: Quotation is the basis of the price; it is not the value of the future contract the price quoted for the product is generally the way prices are quoted in the physical market for example price quotation for future contracts on a rice is rupees per quintal hence the quotation of Rs.550 would mean Rs.550 per quintal and the contract value is Rs.55,000.

(5) Tick Size: Tick size is the minimum change that will be recognized in the price quotation. For rice contract it is Rs.1, hence a price quotation of Rs.551.50 is not possible the tick size for the contract will be rupees hundred (Rs.1 per quintal over 10 MT).

(6) Settlement: Forward contracts were either settled by delivery or by closing out the position at the expiry with opposite contract. The settlement of the futures allows for squaring up prior to the expiry. Being exchange traded the consent of the counterparty is not required. The settlement of future can also be done by cash settlement at the expiry or by delivery. The alternative of settlements or again specified by the exchange. The settlement by delivery can be at option of the seller or at the option of the buyer or compulsory.

(7) Delivery Notice Period: Delivery notice period refers to the period in which for each contract the intention to give or take delivery has to be notified to provide enough time for counterparty to make arrangements.

2.7 OPEN INTEREST

An important parameter in the future market is the open interest. The number of contract outstanding at any point of time is called open interest, as a new contract is introduced the invert investors start taking a view on the market of underlying assets and take an exposure on future contracts. For every buyer of contract there would be a seller. Under normal conditions initially is open interest rises with the time as more and more investors start evincing interest in the new contract and either buy or sale contract depending upon their individual opinion. But as the maturity of contract approaches the investors tend to reduce their exposure and unwind the initial position. Those who were long would unwind by selling the contract and those who went short initially square up by buying the contract. Hence open interest starts declining as maturity approaches. It signifies reduced investors interest in the contract that have little time to expire. Ultimately on the expiry of contract all positions would be squared up. The position that are left exposed by the investors are compulsory settled by the exchange assuming that no delivery is sought by the buyer.

The position is settled by exchanging the difference of closing price and the price of initial contract.

2.8 DIFFERENCES BETWEEN FORWARD AND FUTURE CONTRACTS

As seen from the discussion about the principle and purpose of the forward contract and future contracts are same however there are key differences that have cash flow implication that need to be understood. Besides the standardization and as exchange traded products the future have to substantial differences from forward contract from the viewpoint of cash flow as follows :

(1) Margin Requirements : the exchange serve as a counterparty to both buyer and seller of future contract. The delivery of the underlying asset and the cash flow market to essential ingredients of the future contracts. Despite the fact the most contract or neutralize prior to the delivery the link of delivery and resultant cash flow cannot be broken. The exchange works to eliminate the counterparty risk and therefore it has to assure itself of the financial standing of the participating members. It further needs to curb the tendency of overtrading by the members. To assure itself of financial credit ability of the participants and also to check the speculative tendencies we exchange prescribes the margin to be deposited with it. The margin is some percentage of the contract value and is prescribed by the exchange depending upon the volatility in price of the underlying asset. An initial margin is required to be deposited to open position in the future and is normally set equal to the maximum loss that position can suffer in a day, it is charge from buyer and the seller both. If the initial margin of 4% is stipulated by the exchange it implies that loss is not expected to exceed 4% in a day suppose at Rs.550 per quintal the trader by one contract of price of 10 MT valued at Rs.55,000; he will required to deposit 4% that is Rs.2200 and initial deposit. When the position remains open the trader can incur loss or profit as the price change. Falls to Rs.535 to the next day the trader has to incur a loss of Rs.1500 and his margin now stand reduced to Rs.700 (Rs. 2200 – Rs.1500). Men make the exchange uncomfortable and insecure as any further decline in price will wipe out the entire margin. The exchange therefore prescribes a minimum level below which the margin should not fall. If it does exchange ask the trader to replenish immediately the margin to original level of 4%.

(2) Marking to Market:Initial margin is intended to cover the potential loss in an open position. However the loss that is already incurred during the day has to be made good at the end of the day, it is a practice of exchange to settle the difference of price on daily basis. This daily settlement is referred to as marking to market. For example: investor has bought a future contract on a stock of Maruti Udyog at national stock exchange at a price of Rs.4 10, as each contract consist of 400 shares the exposure is of Rs.1,64,000. There is no cash flow from buyer to seller at the time of entering the contract. Initial margin payable by both buyer and

seller to exchange is ignored for the purpose of this example. Investor hold this position till day four and closes out by selling the contract when the price is 440 at the end he will gain Rs.12,000 from the transaction that is a gain of Rs.30 per share for 400 shares. Ever what happens to the price during the intervening period is to be accounted for in the future contract at the end of each day the profit or loss on the position is calculated and the loss if any is made good to the exchange by the investors. Likewise any profit at the end of each day is credited to the account of the investor. Profit or loss is settled at the end of each day as if the investor was closing out the position. At the end of day one the closing price had risen to Rs.420 the investors account will be credited with the amount of profit of Rs.4000, similarly if at the end of day two the price fell to Rs.400 the investor will have to deposit the loss of Rs.8000 with the exchange. This way the position is Mark Daily to the end of the day price. Its impact on profit or loss remains the same as a difference of buying and selling price as would be the case with forward contract but with the futures contract the net profit or loss is represented as a series of cash flow on daily basis.

2.9 TYPES OF FUTURES

Futures can be classified on the basis of an underlying asset. As stated earlier there can be a host of assets on which future contracts can be created it is a matter of standardization of the contract broadly the futures were categorized into two commodity futures and financial futures.

(1) Commodity Futures are those where the underlying asset is, commodity. Contracts are available in India on agriculture, it is such as wheat, rice, soya, coffee, sugar, tea, cumin, paper, edible oils, cotton, coconut etc. Contracts on metals such as gold, silver or also available in future contracts on oil also available. Future contracts on oil also fall under commodity futures.

(2) Financial Futures are that where underlying asset is a financial product. They can further be categorized into four:

- (a) Currency futures are those where underlying assets or currencies. Future contracts on various currencies are available in major centres such as Chicago, London, Singapore etc.
- (b) Stock Futures are those where underlying our stocks. Stock futures were introduced in 1882.
- (c) Interest Rate Futures are those where underlying assets are interest rates. In India, interest rate futures were launched on 24 June 2003 at NSE. They were re-launched on 31 Aug 2009 with modification to the underlying asset and contract features.
- (d) Index futures are those where the underlying assets are stock indices such as BSE Sensex or NSE Nifty.



MECHANICS AND PROPERTIES OF OPTIONS

Unit Structure

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3.1 INTRODUCTION

An option is a unique instrument that force right without an obligation to buy or sell another asset called the underlying asset. Like forwards and futures, it is a derivative instrument because the value of the right so conferred would depend on the price of that underlying asset. As such option derive their value *ex ante* from the price of the underlying asset. For easier comprehension of the concept of an option an example from the stock as underlying asset is the most apt.

Consider an option on the share of a firm say ITC Limited it would confer the right to the holder either buy or sell a share of ITC. Naturally this right would be available at a price which in turn is derived from the price of the share of ITC. Hence an option on ITC would be price according to the price of ITC shares prevailing in the market. Of course, this right can be made available at a specific predetermined price and remains valid for a certain period of time rather than extending indefinitely in time.

The unique feature of an option is that while it confers the right to buy or sell the underlying asset the holder is not obligated to perform. The holder of the option can force the counterparty to honour the commitment made. Application of the holder would arise only when he decides to exercise the right. Where for an option may be defined as a contract that gives the owner the right but no obligation to buy or sell at predetermined price within the given time frame. It is the absence of obligation to perform for one of the parties that makes the option contract assumption substantially

different derivative product from forwards and futures, where there is equal and binding obligation on both the parties to the contract. This unique feature of an option makes several applications possible that may not be feasible with the other derivative products.

3.2 TERMINOLOGY OF OPTIONS:

- (1) **Call Option** : A right to buy the underlying asset at predetermined price within the specified interval of time is called call option.
- (2) **Put Option** : A right to sell the underlying asset at predetermined price within the specified interval of time is called a put option.
- (3) **Buyer or Holder** : The person who obtains the right to buy or sell but has no obligation to perform is called the owner or holder of the option. One who buy an option has to pay a premium to obtain the right.
- (4) **Writer or Seller** : One who confers the right and undertake the obligations to the holder is called seller or writer of an option.
- (5) **Premium**: While conferring a right to the holder who is under no obligation to perform the writer is entitled to charge a fee upfront. This upfront amount is called premium; this is paid by the holder to the writer and is also called the price of the option.
- (6) **Strike Price** : The predetermined price at the time of buying or writing of an option at which it can be exercised is called the strike price. It is the price at which the holder of an option buy or sell the asset.
- (7) **Strike Date / Maturity Date** : The right to exercise the option is valid for a limited period of time, the latest time when the option can be exercise is called the time to maturity, it is also referred to as expiry or maturity date.

3.3 CALL OPTION

Assume that share of ITC is currently trading at Rs.180. An investor called Ms. Narayani, believes that the share is going to rise at least to Rs. 20 in the immediate future in the next three months. Ms. Narayani does not have adequate funds to buy the shares now but is expecting to receive substantial money in the next three months. She cannot afford to miss an opportunity to own this share. Waiting for three months appliance not only a greater outlay at a later point of time, but also means foregoing of substantial potential gain. Another investor, Ms. Apurva holds contrary views and believes that optimism of Ms. Narayani is exaggerated. She is willing to sell the share.

What can Ms. Narayani do under these circumstances where she cannot buy the shares on an outright basis now? She possibly could borrow to acquire the stock of ITC. This is fraught with risk of falling prices. Amongst the many alternatives that may be available to miss Narayani is included an instrument called a call option. She can instead buy a call option from Miss Apurva stating that Miss Narayani has a right to buy a

share of ITC from Miss Apurva at a price of say Rs.190 at any time during the next three months. This would be a call option. Miss Narayani is the holder of the option while Apurva is a writer/seller of the option. In case Narayani decide to buy the share, she would pay Rs.190 the strike or exercise price. Read up to which Narayani can exercise this option is three months. Note that Narayani has the option, which she may not exercise but Apurva has no such choice and she stands committed to deliver the share and receive Rs.190 from Narayani, irrespective of the price of ITC share at that time. Naturally Apurva would not provide such a right for free as she is obligated to perform at the option of another. Therefore, Apurva would charge some fee called option premium, to grant this right to Narayani. This premium is determined inter alia by the price of underlying asset the ITC share.

We now discuss the situation when Narayani would exercise her option. She would use this right only when the actual price of the ITC share has gone beyond Rs.190. Imagine it has moved to Rs.200. By exercising the option, she stands to gain immediately Rs.10, as he gets one share from Apurva by paying Rs.190 and send immediately in the market at Rs.200. Logically Narayani would not exercise the option if the price remained below Rs.190. In many cases she loses the premium paid. If the price remains below Rs.190, Apurva would not be asked to deliver and the upfront premium she received would be her profit.

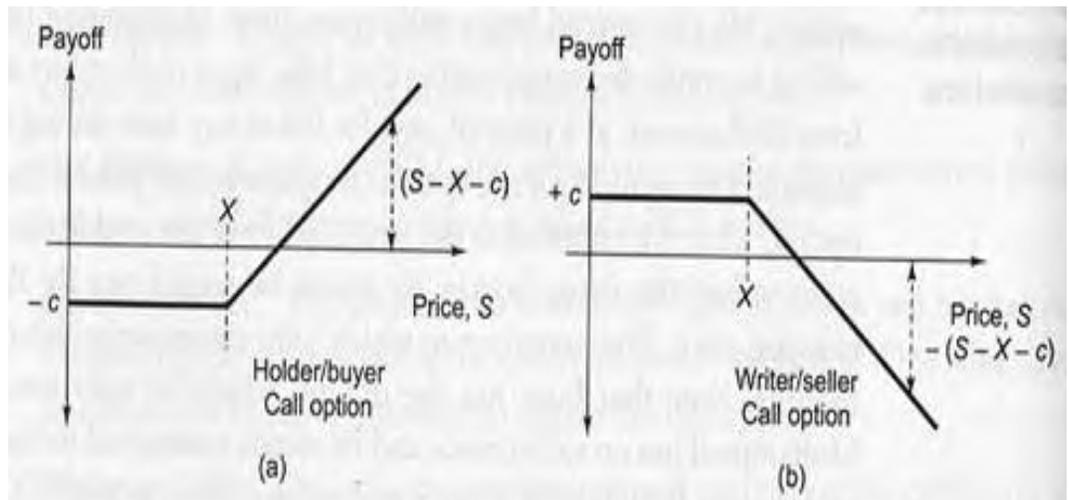
We may generalize the outcome of a call option in the following manner.

As long as the price of the underlying asset S , remains below the strike price X , the buyer of the Col call option will not exercise it and the laws of the buyer would be limited to the premium paid on the call option C and if the price is more than the exercise price the holder exercise the option and generate profit equal to the difference of the two prices.

When,

$S < X$	Buyer lets the call expire	Loss = Premium C
$S = X$	Buyer is indifferent	Loss = Premium C
$S > X$	Buyer exercises the call option	Gain = $S - X - C$
Value of the Call Option = $\text{Max}(0, S - X) - C$		

A graphical depiction of the payoff of the holder and writer of the call options is easier to comprehend and is presented in below figure :



3.4 PUT OPTION

Call option expect the fact that is an option to sell. Again, we take a small example from the Stock Market to classify how put option works. Again, assume that share of ITC is currently trading at Rs.180, an investor Narayani in a position of the share believes that the share is likely to fall to Rs.150 in the immediate future of the next three months. Narayani is not sure of the fall but would like to exit from her investment at Rs.175. She is seeking protection against the heavy fall in the price. Another investor Apurva holding contra view believes that the pessimism of Narayani is exaggerated. She is willing to buy the shares at Rs.175 since she feels that is the lowest it can go.

Narayani believes ITC is a good long-term buy but is unsure when the scrip would show its potential. She does not want to exit unnecessarily. Under these conditions Narayani can buy a put option to Apurva stating that she has a right to sell of shares of ITC at a price of Rs.175 at any time during the next three months. Narayani decided to sell the share she would receive Rs.175 the strike/exercise price in the next three months. Narayani has the option which she may or may not exercise but Apurva has no such choice and she stands committed to pay the agreed price and claim the share. Like in the call option Narayani would not grant such for free and charge some fee called option premium. This premium is determined inter-alia by the price of the underlying asset ITC share.

Apurva would exercise her option only when it is profitable to do so. This option would become profitable when the actual price of the ITC share falls below Rs.175. Imagine that has mood to Rs.160. By exercising the option stands to gain immediately Rs.15 by placing the share to Apurva and realised Rs.175 and using the proceeds to acquire a share of ITC from the market at Rs.160. This keeps his earlier position intact and it gives Rs.15 as a profit. Logically Narayani would not exercise the option if the

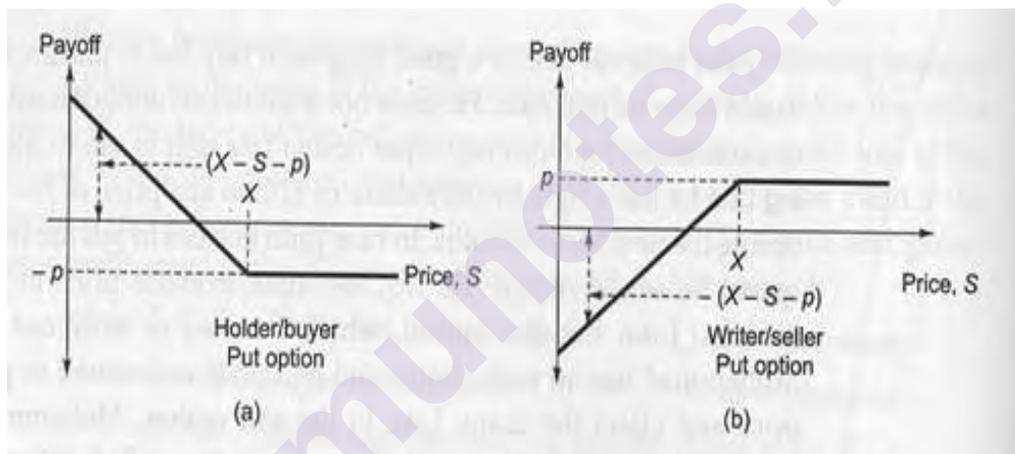
price remains above Rs.175. However, under all conditions she loses the premium paid.

May generalize the outcome of a put option in the following manner.

As long as the price of the security remains below the strike price the buyer of the option will exercise it becomes a stand to gain, otherwise her loss would be limited to the premium paid on the put option P.

$S < X$	Buyer lets the call expire	Gain = $S - X - P$
$S = X$	Buyer is indifferent	Loss = Premium P
$S > X$	Buyer exercises the call option	Loss = Premium P
Value of the Call Option = $\text{Max}(0, X - S) - P$		

A graphical depiction of the payoff for put option, holder and writer is easier to comprehend and is presented in below figure :



3.5 MONEYNES OF OPTIONS

In The Money (ITM), At The Money (ATM) and Out of The Money (OTM) Options:

Depending upon the payoff of the option they often referred to as in the money, add the money or out of the money. At any time ITM options are those which if exercise would result in positive cash flow to the holder. Similarly, OTM option would result in cash flow if exercise and ATM option would have no cash flows.

Call option becomes profitable when the price of the underlying asset exceeds the exercise price. Similarly, a put option is worth exercising when the price of the assets is less than the exercise price. A call option is called ITM when a set price exceeds exercise price. A put option would be ITM when the asset price is lower than the exercise price.

When a set price equals exercise price it is called an ATM option. It applies to both call and put options.

Similarly, when asset price is lower than its price for call option it is OTM, while put option would be OTM when a set price exceeds exercise price.

3.6 TYPES OF OPTIONS

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

- (a) Based on nature of exercise of options
- (b) Based on how are they generated, traded and settled
- (c) Based on the underlying asset on which options are created.

Nature of Exercise : American v/s European

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

Nature of Markets : OTC v/s Exchange Traded

Options can also be categorized as OTC or exchange traded depending upon where and how they are created, traded and settled. Option 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 few futures which may be bought and sold on specific changes where to contracting parties or not to be known to each other but instead enter into contract on the floor or screen of exchange. In the extended option the contract needs to be standardize while an OTC product is tailor made to the requirement of the parties concerned. The standardization of option contract would be in at discretion of the exchange and he's done in terms of :

- (a) Only specific quantity of the underlying acid could be traded on the exchange and need to be predetermined.
- (b) Only specific strike price can be handled in standardised product credit on exchange. OTC product can I have any strike price as agreed by the two contracting parties.
- (c) Light strike price the expiration date too must be known before trading can take place in option at the exchanges.
- (d) Whether the option or American or European in nature too must be known to trader in options.

- (e) Options can be settled either by delivery of underlying assets 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 difference between the exercise price and the price of underlying assets. It can also be settled by 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, indexes, commodities, currencies, and interest rates are available either OTC or on exchanges. In India as of now option on commodities are traded internationally on agriculture products livestock, food products energy and metals. Options are also available on various currencies such as US dollar, euro, yen, pound in major exchanges in the USA and Europe and also other parts of the world. Options on currency are mostly OTC. Besides options are also traded on exchanges on future contracts rate. Options on future have a future contract as underlying assets which gives the buyer a right to buy or sell the specified future contracts within or at specified time. The expiry of the future contract must extend beyond that of option contract. Option can also be traded on interest rate either on cash assets such as treasury bonds and notes or on interest rate futures contracts. These options serve the same purpose this as do the option on stocks and indices. Options on stocks and stock in dices are most common most common, several exchanges across the world offer option on indices and stock. NSE in India offer options on several indices such as nifty, a broad-based index of 50 stocks from banking, information technology, infrastructure etc. Presently these options are limited price and cover periods up to 3 months. However internationally options for longer period of up to 2 to 3 years are also available. NSE attempts to provide minimum five strike price that is 2 ITM, 1 ATM and 2 OTM at any point of time.

3.7 TRADING AND SETTLEMENT

The life of the option contract is specified when the contract is entered. No right can be given forever. Number of contracts that are not yet settled is known as open interest. All option contract must close by any of the three modes by exercise, by letting it expire or by selling.

(a) By Exercising: As options are brought with a view to make profit, there would be exit opportunities to make again. The holder of an option may decide to exercise the right and force the writer to honour the obligation undertaken. The writer has to deliver the assets under call or pay the price for the or state under a food. Note that application applies for the writer of the option and not to the holder of an option. The holder has a right to exercise. If American the exercise can be done at any time and if European exercise only be at maturity.

(b) By Letting Option Expire: is not necessary that the holder exercise the option whenever profitable opportunities arising during the life of an option. Even if the option is profitable the holder may not exercise the right in the hope of making larger gain later. If no action is taken by the option holder the obligation of the writer would cease automatically upon maturity of the contract.

(c) By Selling The Contract: apart from exercising or letting it expire, the obligation in the option contract may be nullified by entering into an offsetting contract that creates obligation opposite to that of the initial contract. Two points must be noted here. First, obligation under the initial and subsequent contract were independent and remain as they were but get nullified only on a net basis; Second, it must be noted that obligation under call and put are not opposite and nullifying. An application created by writing a call gets nullified by buying a call and not by put option.

(d) Assignment: in case of OTC option the buyer and seller of options enter the contract directly and therefore the holder knows whom to approach if and when he decides to exercise his right. The writer of the option has to fulfil the obligation. In an exchange traded option, the buyer and the seller enter the contract through exchange with the buyer and the seller unknown to each other. To each of them the counterparty is the exchange. If the buyer needs to exercise the option he has to advise the decision to the exchange only. Such a case the exchange has the task of making good the claim made by the holder of the option. A suitable writer needs to be identified among several options sellers. Among many others assume that you have bought a call option at strike price of Rs. 20. You do not know who exactly has written the call. If the asset price has moved up to Rs. 25 then by exercising the call you stand to gain Rs. 5. Not all investors decide to exercise the call. If you decide to exercise someone must pay you Rs. 5. The exchange therefore assigns the liability to one of the several writers of the option who will be assigned the liability arising out of the exercise by one of the folders. It is normally done on a random basis. The one who is assigned the liability makes the payment, and therefore loses the opportunity of cancelling the obligation by entering into an opposite contract. If the short position in the option was taken as a hedge the seller now stands exposed to the risk again that he had presumably covered through the initial position. In case of European options the issue of assignment does not arise as on the date of maturity there is equality of long and short position. However in case of American option the issue of assignment does arise as on the date of maturity there is equality of long and short position however American option can be exercised any time before or on maturity. The exchange has a responsibility to assign the exercise option to some seller of option this exercise of assignment is carried out during non-trading hours. Exchange allows only cash settlement of option and therefore only ITM options are allowed to be exercised.

3.8 MARGINS IN OPTIONS

Options are lopsided contracts where the buyer has no obligation to perform except upon exercise. In case of a call the holder has to deliver cash equal to exercise price and in case of a put the underlying asset. On initiating a position, the buyer of the option satisfies his application by paying the premium. On the opposite the writer of the option faces unlimited risk in case price of asset moves unfavorably. Exchange has the responsibility for settlement it faces risk from the seller of the options. Position in option for cash settled it is assumed that the writer of option would nullify the liability by paying the option back. His obligation would limit to the premium payable on buying less premium received from selling option. The credit risk of the exchange can be eliminated if position of the seller is marked to market (MTM) and losses collected as it is done in case of futures. In case of futures MTM losses collected or past as MTM profits. This too could be followed

in case of option where MTM losses collected from seller or losers are passed on to option buyer or Gainer. If such a practice is adopted the position of option buyer would need to mark to market and they to be subject to margin call. Practice is referred to as future style option where both buyer and seller are marked to market. As an alternative the exchange may decide to keep all MPM losses collected from writers with itself and not pass on to the gainer. This is known as premium style option. Most exchanges follow premium style option for margin in which obviate the need for marking to market for option buyers. Only writers of the options have to make good the MTM losses.

3.9 ADJUSTMENT FOR CORPORATE ACTIONS ON STOCK OPTIONS

Options or contracts that are settled by delivery or cash in future, with the implicit assumption that basic characteristics of the underlying as it do not change during the tenure of options. However stop issued by firm or subject to corporate action at any point of time. Corporate actions such as dividend, bonus shares and stock split change the value of stock and such options on the stock to code change in value. This action being not part of normal process of price determination of options and the underlying acid require change in the characteristics of an option.

(a) Adjustment of Dividend: options traded on stock exchange do not provide for adjustment of dividend. The price of the stock falls by the amount of dividends on the ex-dividend date. Therefore, Intrinsic value of the ATM call to fall by the amount of dividend on the ex- dividend date. Ideally strike of the call must be reduced by the amount of dividend to so as to keep the intrinsic value same. Option premium depend upon the value of the underlying stock would change on ex-dividend date. The difference in the option premium must be equal to the present value of the dividend. Since stock prices are supposed to be present value of all future expected dividend, there seems to be little logic in adjusting for the payment of cash dividend. No adjustment to the option feature is made with respect to cash dividend on the stock. However extraordinary dividends or not anticipated by the investor neither in the price of underlying nor by trader in derivatives. In such cases the adjustment to the option contract can be made by reducing the strike price appropriately. In Indian stock market a dividend in excess of 10% (subject to change) of the value of the stock promotes adjustment to the strike price.

(b) Adjustment For Bonus Share: good Times firm also make bonus offer by capitalizing the reserves rather than cash dividend though it does not change the aggregate value of the share in the hand of the investor it affect the price of shares substantially as the large number of shares become available for same value. For example, consider as 3:5 bonus issue by a firm with share price of Rs.200. The value of 5 shares is Rs. 1000. After the bonus issue same five shares become eight and in order to keep the value same the shares must now trade at Rs.125 (1000 / 8). Since the aggregate value of the underlying asset has got not change but for its composition therefore the value of land contract two must not change but for its composition. For parity of cum-bonus and ex-bonus the following two adjustment must be made to the option contract.

- (1) The number of shares in the contract must increase by $(1 + \text{Bonus ratio})$
- (2) The strike price must reduce to $1/(1 + \text{bonus ratio})$

If there is ATM call at Rs.200 for 100 shares the contract must now stand modified as an option to buy $100 \times 2 = 200$ Shares, i.e. Original Contract Size $\times (1 + \text{bonus ratio})$ at strike price of $200/2 = \text{Rs.}100$ i.e. the original strike price $/ (1 + \text{bonus ratio})$. These two adjustments would keep the commitment under option contract same.

(c) Adjustment for the Stock Splits: the stock split the number of shares increase with the price reduced proportionately for example a 2:1 split doubles the supply of share and that must reduce the price of the share a half. This meant as in case of bonus issue with respect to contract size and exercise price or made so that the value of the option contract pre split and post split remains the same. Therefore the exercise price must be used to half and the number of shares in option contract must be double.



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OPTION TRADING STRATEGIES

Unit Structure

- 4.1 Introduction
- 4.2 Straddle – Long and Short
- 4.3 Strangle – Long and Short
- 4.4 Straps and Strips
- 4.5 Bull Spread
- 4.6 Bear Spread
- 4.7 Butterfly Spread
- 4.8 Condor Spread
- 4.9 Calendar Spreads
- 4.10 Diagonal Spreads
- 4.11 Box Spread

4.1 INTRODUCTION

Position of single option provides an even gain or losses with the change in the price of the underlying assets. For payment of small premium a call option gives unlimited upside gain, while a put option provides larger gain in falling markets. Because of the non-symmetric profile of risk and return, options can be used as a combination in many way that can generate vast number of risk profiles. New strategies are used for trading as well as for hedging purposes. If options are combined with the objective of containment it would be called hedging but when combined to take a specific view on future price and the risk it would become speculative. The major distinction between hedge and speculation would be whether the position taken is with the view of reducing risk or assuming risk. Option prices being dependent on many factors as compared to other derivatives the dimension of risk can be with respect to many parameters. This parameters or time, volatility, assets, price along which many positions can be formed. This flexibility do not exist with futures and forwards being instrument of not as many parameters.

Combination of options can be done on various parameters some of them or as follows:

- (a) Different type of options
- (b) Different exercise prices
- (c) Different ratio of calls and puts.
- (d) Different expiration times.
- (e) Different underline assets.

The risk profile of the combination of option is an aggregation of the risk profiles of the individual options constituting the combination. Some of the most common and popular combinations which are certainly not exhaustive are discuss here.

4.2 STRADDLE – LONG AND SHORT

Straddle is a combination of simultaneous position taken in the call and the put option on the same underlying asset with same expiry. Straddle constitute long call and long coat with the same strike price on the same as it with the same expiry. As both the options are brought it cost to set up a long straddle.

If the price remains equal to exercise price both call and put remain on exercise and the investor lose the premium. However, if the price moves away from the exercise price either the call or the put becomes in the money depending on the direction of price moment. The investor start recovering big boss incurred in setting up of long straddle.

If the price goes higher than the exercise price call option become in the money and if the price is below exercise price the put option is in the money. Long straddle a suitable strategy when one expect volatility in the price of the underlying asset. An investor with long straddle game with price movement in either direction. It is suitable in time when large movement in price is forecast but the direction of movement is uncertain.

The short straddle his form by simultaneous selling a call and a put on the same as It with the same strike price and same expiry. It generates income as a premium on both the option that is call and put written, are received. With the change in the price of the underlying acid either the Call or the food return goes in the money. Movement of price away from exercise price is detrimental to the interests of the investor with short straddle. Position of short straddle is suitable for investors who foresee stability rather than volatility of the price around exercise price.

Note that combined position of long and short straddle result in 0P of confirming the view that options or zero-sum game.

For example : The Long straddle where the investor has bought a call and put both at the same strike price of Rs.780 on the same underlying acid, the stock of reliance with the same expiry dates. In setting up this putfolio the investor in incur a cost of Rs.25 equal to the sum of the premium on call and put. Would be maximum loss. The investor breaks even with the price of reliance had to pay 755, when put is exercise and at Rs.8 05 when call is exercise, Long straddle ends up in a profit with the price of Reliance below 755 or above Rs.805. Within the range of Rs.755 to Rs.805 there would be some losses with a big loss at the price equal to the strike price of two option that is Rs.780.

The payoff for Investor of short straddle called a writer of a straddle would be exactly opposite to the investor of long straddle. His big profit would be Rs.25 when the price of Reliance remained static at Rs.780 the strike price of the option written. Search investor would incur losses when the price of Reliance falls below Rs.755 or goes about Rs.805 however his breakeven would be same as that of investor with long straddle. The writer of straddle strongly believes in the phenomena of convergence of price – the price of the asset converges to the strike price when options are close to maturity.

Saddle is not an appropriate strategy if the asset stays in the tight trading range and does not break out sufficiently before the expiry of option. The right way would be to set up a straddle just before the anticipated price breakout and depending upon the direction of breakout immediately liquidate one of the option to earn further income.

Being combination of independent call and put option long straddle may be created without an investor with an equivalent short straddle. Call and put option may be bought from different person to have long straddle. Same applies to creation of short straddle which may be created without corresponding long schedule. However few exchanges offer straddle as an independent composite product.

4.3 STRANGLE – LONG AND SHORT

Strangle is similar to straddle except that in strangle the exercise price of call and put option bought/written are different. For a long Strangle the exercise price of the put option is lower than that of call option. If the price remain within the two exercise prices none of the option is exercised and the premium paid on the option is lost. If the price goes above the strike of the call or goes below that of the put long strangle starts paying of the cost initially and then result in the profit if movement is large enough.

For a short strangle the premium earned by the investor is the profit if the price remain within the band of two exercise prices.

Both the call and put options are out of the money when one set up the Long Strangle for shares of Reliance trading at Rs.780. Strangle is created by buying a call at $X = 800$ and put at $X = 716$. Within the price range both the call and put options are worthless. When the price goes below Rs.760 the put becomes valuable and when the price is greater than Rs.800 call terms in the money.

Like straddle strangle becomes profitable with a large breakout of the price in either direction. The strategy is fruitful under number of situations where volatility is expected with the direction unknown. Some of them are described below:

- When stock is trading in the range with a variety of identified resistance and support level and when does not know which of the two

would be pierced, the breakouts are usually significant whenever they occur.

- Another situation favourable for going long on strangle or the times of takeover attempt. Great uncertainty exists when takeover attempts are made. Similar situation when some litigation reaches a point of decision specific to a particular firm.
- Yet another time to have long strike triangle is when widespread uncertainty prevailed at the time of major or significant economic or political events such as presentation of budget, announcement of monetary policies, declaration of election result which caused large movement in the market price but with direction unknown.

A standard cost lesser than the Stadel has the call with high year exercise price and put with a lower exercise price would cost lesser. With lesser cost of strangle the investor with long position low losses on some of the likely gain from the volatility as compared to the position of long saddle. Investor with long strangle on lesser profit but over a smaller range of price as compared to invest with long straddle once larger profit but at single price. Similar observations regarding losses can be made for an Investor with a short strangle and short straddle.

4.4 STRAPS AND STRIPS

In a long straddle or is tangible the payoff from the volatility what is symmetrical in either direction of movement of price. This was due to equal position taken in the call and put option in terms of number of contracts.

The payoff from changes in price can be made unequal and non-symmetrical by changing the ratio of call and put option. For example if the investor not only expect the volatility in price but also believe that likelihood of prices going up is far more than the prices coming down then we can buy two calls rather than one along with one put. In such a case the gains from upside movement would be double as two calls will become in the money. The gain from upside movement will be larger than straddle, and remain same for downside moment. This combination is known as strap.

Similarly in the opposite situation of expected volatility being higher for downside movement as compare to the upside movement the investor can buy two put and one call. When prices goes down to puts become in the money and when prices go up only one call become in the money, making gain unequal for same rise then fall in prices this combination is known as strip.

4.5 BULL SPREAD

Combinations as discussed above are created using two different types of options on the same asset and same expiration date. Spread is created with the position on the same type of option on the same underlying asset but with different strike prices. Spread can be created using either call or put. Bull and bear spread are discussed here.

A bull spread is used by one who is moderately bullish about the market in the near future. Buying a call is regarded as more bullish but if cost becomes a consideration and prospect is not as bright then one can reduce the investment in call by writing another call at higher strike price than the one bought, thereby decreasing investment and increasing returns on the investment.

The call with higher strike price trades at lower premium than the call with lower strike price. There will be net cash flow while setting up a bull spread. This is also known as debit spread as it resulted in an outflow of cash at the time of set up.

If the market does not rise as expected the price remains below both the strikes, both calls would expire worthless. Loss will be limited to the differences of the premium paid and received on the call bought and return respectively. If the spot price is higher than both the strike price, both the call will be in the money and the payoff shall be equal to the differences of the strike price less set up cost.

4.6 BEAR SPREAD

Opposite to that of bull spread is a bear spread. An investor who believes that the market will be weak in the near future deploys a bear spread by buying a call with higher strike price and simultaneously writing a call with lower strike price. The set up of bear spread is likely to generate a positive cash flow since call written with lower strike on more than the call bought with higher strike price and this is called a credit spread. Bear spread is useful when one is moderately bearish.

For example : call of Rs.2600 is bought and the one with the strike of 2500 is sold netting in Rs.28 which is the maximum profit when the market remains flat and both the calls are worthless the investor makes the profit equal to the income generated while setting up the bear spread however if the market behaves contra to the expectation and rises so as to make both the call in the money the investor loses. Or loss will be equal to the difference in the strike price of the two calls less than the income generated in creating the bear spread position.

This strategy is a bearish strategy but not as risky as a written naked call. It limits the losses to the differences in the strike price of the calls less initial cash inflow. Writing a naked call would be extremely risky and such

strategy is adopted when one is extremely bearish. Under bear spread one Paul is bought to provide protection against substantial price rise. Both bull and bear spread can also be created using the put option alone it would have the same profile of pay off as that with the calls.

Both bull and bear spread limit the upside and downside potential as compared to the Prabh position in single option. Buying a call provides unlimited upside gain while protecting the downside loss. By writing another call at higher strike price in bull spread one reclaim some of the premium paid on the first call sacrificing upside potential. Similarly writing a call implies unlimited downside loss while earning premium. By buying another call at a higher strike price while creating a bear spread the investor limit downside loss and sacrifice some income.

4.7 BUTTERFLY SPREAD

Butterfly spread is created by option with three different strike price as follow:

- Buy one call with strike price X_1
- Buy another call with higher strike price X_3 .
- Two calls at strike price X_2 that lies between X_3 and X_1

The two calls written at strike of X to around a current level of price the underlying asset make income. The call at lower strike price X_1 is in the money and commands a larger premium. The other call bought with higher strike price X_3 is out of the money and has a lower price. The initial cost of creating a butterfly spread is nominal which is great attraction to set up the butterfly spread.

If the two calls that are bought have the strike price as X_1 and X_3 the strike price of two columns written at X_2 is normally chosen as average of X_1 and X_3 . If the price remains below X_1 all calls or workpiece and expire without exercise.

The investors suffer a nominal loss is equivalent to set up cost. If the price exceeds X_3 all calls are in the money and exercise. Two calls bought compensate exactly for the liabilities of the two calls return and investor ends up with nominal loss equal to the cost of spread. When price is above X_1 but below X_2 only one called but is in the money and the investors start making profit. He has maximum profit when price reaches X_2 beyond which both the call return become in the money and get exercise. He starts losing the profit as he pay for two calls and receive from one call. When price reaches X_3 the second call what also become in the money matching the aggregate liabilities on the call written.

4.8 CONDOR SPREAD

Condor is modified version of the strangle. It is a less risky than strangle. Uses for strike price X_1, X_2, X_3 and X_4 – set of to use in triangle with $X_1 < X_2 < X_3 < X_4$. Condor products created as follows.

- Buy call with two out a strike price that is X1 and X4
- Same call with strike price in between X2 and X3.

This can also be thought as a combination of bull and bear spread, a bull spread with lower strike price and bear spread with higher strike prices. A call with X1 and X to construct a bull spread while other to call make bear spread.

All calls or out of the money for a price below X one. Between X1 and X to the call board with lower price is in the money leading to gain. Between X2 and X3 call written and one called baht cancel out and other set of calls have not come in the money as yet. Between X3 and X for the second called return is exercise and the liability arises the price beyond X for all four calls or in the money but the call bought and written cancel out each other. Condor can also be formed with put alone or from a combination of calls and puts. An investor by two puts with out a strike price of X1 and X4 and write two with strike price between X2 and X3 he will have the same profile as the one created through calls. Condor can also be formed with a set of calls long at X1 followed by short at X2 and set of put, Long at X3 and shot at X4. Usually the combination that cost less is chosen.

Long Condor looks like a short strangle with extreme curtailed two wins similarly a short Condor is similar to long strangle. The condor is deemed as less risky version of strangle. Long condor can also be seen as a butterfly spread with flattened top. A strangle when chipped at the end from the Condor, Condor cost less and compromise is on curtailing the game at extreme prices. Along Condor can also be treated as a combination of bull spread and bear spread. An investor has a choice to choose the exact risk profile desired by him.

4.9 CALENDAR SPREADS

Calendar spread or form by using the option on the same as it with the same exercise price but with a different expiry expiration dates. An investor of calendar spread is aiming to make a profit based on the time value of options. A bullish University take a position in calendar spread on the premise that the price of acid would not increase enough in the new near term but would exceed predetermined level in the longer term. For bullish investor by a distinct call and writes a near call, expecting the distant call bought to be in the money and expiration while reducing the cost by writing a near call. Only very experienced investor uses such strategy.

Similarly, a bearish investor may buy a near call but sale a distant call in the hope that price would rise enough in the near-term to make the near call in the money but will fall thereafter so as to make the distant call out of the money.

As we know that the value of an option consists of two particles that is the intrinsic value and time value. Unlike other spread calendar spread play on the time value of option. With larger time to maturity the time value

declines but not fast enough. Time value declines more rapidly as maturity in nears. An investor of calendar spread capital life by writing option who is time value declines more rapidly.

4.10 DIAGONAL SPREADS

Diagonal straight or constructed by using different strike price and different maturities of option on the same base. The interpretation and objectives of such great or hard to explain and R2 numerous for tabulation and generalization.

However as an example consider an investment investor who believes that the price of the stock will exceed Rs.80 by November but remained below Rs.100 till December the investor can adopt following strategy

- Buy Nov Call at X = 80 paying a premium of Rs. 5
- Write Dec Call at X = 100 earning a premium of Rs. 10

	Price < 80		80 < Price < 100		Price > 100	
	In Nov	In Dec	In Nov	In Dec	In Nov	In Dec
Dec Call at X = 100	-	-	-	-	-(S - 100)	-(S - 100)
Nov Call at X = 80	-	-	S - 80	-	S - 80	-
Initial Income	5	5	5	5	5	5
Net Profit	5	5	25	5	25	(S - 105)

As is apparent the investor rules out the possibility of price in excess of hundred at the end of December and hence his payoff is larger than the strategy of simply buying a November call at Rs.80 which would give him maximum of Rs.15 as profit. By writing another call at rupees hundred for distant future he earns an extra premium of Rs.10 and at the same time has an option to square up the December call any time, in case his forecast about the future price appears to be failing.

4.11 BOX SPREAD

Though options are thought to be risky in nature their combination can be remarkably stable different options can be combined to obtain a risk-free position search position called box spread.

A box produce created by (a) buying a call and writing a put at the same strike price (b) simultaneously selling another call and buying a put again at the same strike price but different from those in (a)

This result in certain profit equal to the difference of two strike price. This may be used for arbitrage in the pricing of different options as follows :

Cost of Box Spread	>Discounted value of the box spread; Go short on the box spread
Cost of Box Spread	<Discounted value of the box spread; Go long on the box spread.

FACTORS AFFECTING THE SPREAD

While trading on independent and single option is rather easy, creating a spread it require deep thinking and understanding before assuming a position. Though in general spread or safer, then construction needs prior evaluation in terms of the following factors.

(1) Initial Cost of the Spread : Dealing in spread means trading in multiple options involving long and short positions. Short position implies cash inflow in the long position means the cash outflow, resulting in cost or income at the time of set up. An investor has to determine the additional parameter of the initial cost or income in setting up of the spread. Since similar risk profile is obtainable in several way from either put or call one has to find out a way to create a spread at minimum cost or with maximum income. A complete understanding of risk profile with the prevailing market price of various options required.

(2) Initial Margin Requirements : urgent requirement on the position as independent contract or different than for specific combination of options. Buyer of the option does not need to bring any margin as he is under no obligation to perform. His obligation towards the contract is met when he pay the required premium. The writer of an option under an obligation to perform is required to deposit margin with the exchange. Margin for writer of option or larger for independent single contract than for spread which is simultaneous position on several options.

(3) Risk Profile And Selection Of Exercise Prices : an additional parameter in construction of spread is to know exactly the risk profile required to be generated which in turn involves selection of particular set of exercise price out of the many that are available. The liquidity of distant options and those deep in the money or deep out of the money is over compared to near option and at the money options. Pricing may be not competitive for distant and deep in the money options. This restrict the choice for trade trading, it is suggested to create a spread with frequently traded options to obtain competitive pricing and necessary liquidity as one needs to unwind the original spread before expiration of option. It is possible that at around expiration time the combination may become a liquid and one has to be on constant vigil for unwinding.



INTRODUCTION TO OPTIONS

Unit Structure

- 5.0 Objectives
- 5.1 Introduction
- 5.2 Introduction to Options
- 5.3 Valuation Binominal Model for valuation
- 5.4 Black and Scholes Model,
- 5.5 Summary
- 5.6 Unit End Questions
- 5.7 References

5.0 OBJECTIVES

After studying this unit, you will be able:

- To understand Options
- To discuss valuation Binominal Model for valuation
- To understand Black and Scholes Model,

5.1 INTRODUCTION

A contract known as an option gives its holder the choice to buy or sell an underlying asset or financial instrument at a predetermined strike price on or before a specified date, depending on the option's form. This option may be used before or after the contract's stated expiration date. The spot price (market price) of the underlying securities or commodity may be used to determine the option's striking price on the day it is offered. Alternatives include setting the strike price at a premium or a reduction compared to the going rate. If the holder "exercises" the option, the issuer is obligated to execute the transaction (either to sell or to buy). The right to buy at a specific price is granted by a call option, and the right to sell at a specific price is granted by a put option. Financial derivatives are a category that includes both of these choices.

5.2 INTRODUCTION TO OPTIONS

As part of another transaction (such the issuance of shares or an employee incentive programme), an option may be granted to the buyer. Alternatively, the buyer may pay a premium to the issuer in exchange for the option. As an alternative, the issuer may decide to provide the buyer the option. The strike price of a call option normally needs to be less than the underlying asset's current market value in order to be exercised. In

contrast, a put option would normally need to have a strike price higher than the asset's current market value in order to be exercised. When an option is exercised, the holder of the option, in addition to any premium that is due to the "issuer" of the option, must pay a sum equal to the "strike price" of the asset being purchased. The option is said to have expired and the holder's premium payment to the issuer is regarded as having been lost if the expiry date of the option passes without being exercised. In any instance, the premium represents income for the issuer but, in the majority of circumstances, represents a capital loss for the option holder. The owner of an option may resell that option to a third party in a secondary market via an over-the-counter transaction or on an options exchange, depending on the type of option. Any of these two options can happen in this situation. An option drafted in the American manner frequently closely reflects the market price of the underlying stock. The difference between the underlying stock's current market price and the option's strike price is used to determine the market price of the option. The real price of the option on the market may change depending on a variety of variables. A substantial option holder who needs to sell the option because the expiration date is approaching and they lack the funds to exercise the option is one of these circumstances. A buyer in the market who is aiming to accumulate a sizable option holding is another factor. Most of the time, holding an option does not grant the holder any rights over the underlying asset, such as voting rights, nor does it grant them any income from the underlying asset, such as dividends. These are some instances of rights that are normally not granted by option ownership.

Options on modern stocks and shares:

Options-based contracts have been used for many years. When the Chicago Board Options Exchange was established in 1973, it led to the development of a system that included the use of standardised terminology and forms, as well as the trading of assets through an insured clearing house. Since then, both business activity and scholarly interest have increased. Other OTC options are drafted as bilateral, customised contracts between a single buyer and seller, either of whom may be a dealer or market maker. Today's market features a large number of standardised options that are created and exchanged via clearing houses on authorised options exchanges. Options are a type of derivative product, which is sometimes just called derivatives. Derivatives are a broader category of financial instruments than only options.

5.3 VALUATION BINOMIAL MODEL FOR VALUATION

A common technique in finance for valuing options and other financial derivatives is the binomial model. It is predicated on the notion that the price of the underlying asset exhibits discrete binomial distribution. Other kinds of investments and securities can be valued using the binomial model.

An explanation of how to apply the binomial model for valuation is given below:

- **Recognise the underlying asset:** Establish the details of the asset you are valuing, including its current price, volatility, dividend yield (if applicable), and expiration date.
- **Decide on the time intervals** by dividing the remaining time into a predetermined number of periods. The model's complexity and necessary accuracy determine how many periods are needed. Every cycle corresponds to a distinct time step.
- **Determine the elements** that affect the asset price's upward and downward movement in each period by computing the up-and-down factors. These variables are depending on the asset's volatility and the time frame. Typically, the following formulas can be used to determine the up factor (u) and down factor (d):

$$u = \exp(\sigma * \sqrt{\Delta t})$$

$$d = 1/u$$

Where:

σ is the volatility of the asset.

Δt is the length of each time period

- **Binomial tree construction:** Begin by creating a binomial tree with the current asset price as the first node. Determine the potential asset prices based on the up and down factors for each succeeding period. As a result, a tree-like structure with numerous nodes reflecting potential future prices will be formed.
- **Calculate option values:** Based on the option's payoff at that price, determine the option values for each node starting with the final nodes (at expiration). A call option, for instance, would have a maximum payment at each node of zero or the difference between the asset price and the strike price. The greatest payoff for a put option would be zero or the difference between the strike price and the asset price.
- **Move backward through the tree,** determining the value of each option depending on what is anticipated to happen at the next nodes. This entails utilising a risk-free interest rate to discount the anticipated option values for the following time period.
- **Calculate the option value.** The calculated option value at the initial node (beginning point) is the projected fair value of the option or securities you are pricing.

An Overview of the Fundamentals of the Binomial Option Pricing Model :

Binomial option pricing models are predicated on the idea that there are two possible outcomes; this is how the "binomial" part of the model gets its name. An rise in price or a drop in price are the two outcomes that can occur when utilising a pricing model.

One of the main advantages of binomial option pricing models is that they are mathematically simple. However, these models may grow quite complex when used with data covering multiple time periods.

The binomial model allows for the computation of both the asset and the option for many time periods as well as the range of outcomes that are viable for each time period separately, in contrast to the Black-Scholes model, which creates a numerical output depending on the inputs.

When employing this multi-period view, one of the benefits is that the user can see how asset prices vary over time and evaluate the option based on decisions made at various points in time. The binomial model might provide information about when it might be profitable to exercise an option with a U.S. basis and when it should be kept on the books for longer periods of time when it has no expiration date and can be exercised at any time. At any time, the option may be exercised.

By examining the binomial tree of values, a trader can predict when a decision regarding an exercise may be made. If the value of the option is greater than zero, it should be held for lengthier periods of time before being exercised; however, if the value of the option is less than zero, it should be exercised right away.

The Binomial Model's Application to Price Calculation:

Prices for different financial instruments, particularly options and derivatives, can be determined using the binomial model. Here are some significant uses of the binomial model in determining prices:

- **Option pricing:** Both the European and American versions of the binomial model are frequently used to value options. The approach builds a binomial tree to represent potential price trajectories for the underlying asset, calculates the option values at each node, and then works backward to estimate the starting point's fair value of the option. This strategy considers elements such the strike price, the remaining time before expiration, volatility, and the risk-free interest rate.
- **Bond pricing:** Bonds having embedded options, such as callable or puttable bonds, can be valued using the binomial model. The model determines the bond's value by discounting the anticipated cash flows at each node of the binomial tree and treating the optionality as a set of alternatives. This makes it possible to estimate the bond's price more precisely while taking the likelihood of early redemption into account.

- **Convertible securities:** The binomial model can be used to value convertible bonds and other convertible securities. The option to convert the security into common shares at a preset conversion ratio is included in the model. The binomial model can calculate the fair value of the convertible instrument by analysing the anticipated cash flows from the bond's fixed income component and the possible gain from converting into equity.
- **Risk management:** The binomial model can be utilised for this purpose as well. The binomial tree can be used to simulate various price scenarios and be used to analyse the potential outcomes and related risks. This enables more informed decisions to be made about risk reduction, portfolio allocation, and hedging techniques.
- **Real options:** Real options are investment opportunities that offer flexibility and the capacity to adjust to shifting market conditions. The binomial model can be used to value real options. Real alternatives might be the choice to enlarge, postpone, or drop a project. The flexibility of the binomial model makes it appropriate for reflecting the value of various strategies.

Binomial Options Calculations:

Binomial options calculations involve using the binomial model to determine the value of options at different nodes of the binomial tree. Here are the key calculations involved:

1. Calculation of up and down factors:
 - Calculate the up factor (u) and down factor (d) using the formulas: $u = \exp(\sigma * \sqrt{\Delta t})$ $d = 1/u$ where σ is the volatility of the underlying asset and Δt is the length of each time period.
2. Construction of the binomial tree:
 - Start with the current price of the underlying asset as the initial node.
 - For each subsequent period, calculate the possible asset prices at that time based on the up and down factors. This involves multiplying the current asset price by u and d to obtain the upward and downward price movements.
3. Calculation of option values at expiration:
 - Determine the option's payoff at each node at expiration based on the option type (call or put) and the difference between the asset price and the strike price.
 - For a call option, the payoff at each node is $\text{Max}(0, \text{asset price} - \text{strike price})$.
 - For a put option, the payoff at each node is $\text{Max}(0, \text{strike price} - \text{asset price})$.

4. Calculation of option values at preceding nodes:

- Starting from the final nodes (at expiration), move backward through the tree and calculate the option values at each node.
- For each node, calculate the expected option value as the discounted value of the expected payoffs at the subsequent nodes.
- The expected option value at each node is given by the formula:

$$\text{Option value} = (p * \text{option value up} + (1 - p) * \text{option value down}) / R$$
 where p is the probability of an up movement, option value up is the option value at the node representing an upward price movement, option value down is the option value at the node representing a downward price movement, and R is the risk-free interest rate.

5. Determination of the option value:

- At the initial node (starting point), the calculated option value represents the estimated fair value of the option.
- This value takes into account the discounted expected payoffs at each node and the probabilities of the different price movements.

The above steps provide a general overview of the binomial options calculations. It's important to note that the number of nodes in the binomial tree increases exponentially with the number of time periods, leading to more complex calculations. Therefore, advanced software or programming tools are often utilized to implement the binomial model efficiently.

5.4 BLACK AND SCHOLES MODEL

Option pricing theory determines the value of an options contract by attaching a price, also known as a premium, to the contract and basing that price on the likelihood that the contract will expire in the money (ITM). The main goal of option pricing theory is to estimate an option's fair value so that traders may incorporate it into their trading plan.

Pricing models, in addition to the current market price and the strike price, also take into account a variety of other elements when evaluating an option potentially. Volatility, interest rates, and the remaining time before the option expires are some other factors. A few models that are frequently employed in the process of valuing options include Black-Scholes, binomial option pricing, and Monte Carlo simulation.

The Black-Scholes model, also known as the Black-Scholes-Merton model, is a widely used mathematical model for pricing options and other derivatives. It was developed by economists Fischer Black and Myron Scholes in 1973, with contributions from Robert C. Merton. The model is based on several key assumptions, including:

1. Efficient markets: The model assumes that markets are efficient, meaning there are no opportunities for risk-free arbitrage.

2. Log-normal distribution of asset prices: The model assumes that the price of the underlying asset follows a log-normal distribution over time. This assumption allows for the incorporation of historical price data and the estimation of future price movements.
3. Constant volatility: The model assumes that the volatility of the underlying asset's returns is constant throughout the option's life. This assumption is known as the constant volatility assumption and is an important factor in option pricing.
4. No dividends: The model assumes that the underlying asset does not pay any dividends during the option's life. This assumption simplifies the calculations but can be adjusted to incorporate dividend payments if needed.

Option pricing theory describes the method of valuing an options contract within a probabilistic framework.

- Calculating the likelihood that an option will be exercised, commonly referred to as being in-the-money (ITM), at the time the option's term expires is the fundamental goal of option pricing theory.
- An increase in an option's maturity or its implied volatility, with all other factors remaining constant, will drive up the price of the option.
- Only a few of the models that are frequently used to value options include the Black-Scholes model, the binomial tree model, and the Monte Carlo simulation method.

Acquiring Knowledge of the Option Pricing Theory:

The main goal of option pricing theory is to determine the probability that an option will be exercised, often known as being in the money at expiry, and to assign a monetary value to that probability. The underlying asset price (such as the cost of a stock), the exercise price, the volatility, the interest rate, and the time until expiration are often used variables that are entered into mathematical models to determine an option's potential fair value. The number of days between the computation date and the day the option may be exercised is referred to as the time till expiration.

The idea of pricing options also creates a set of risk factors or sensitivities based on those inputs. These are referred to as an option's "Greeks," and they are obtained from the inputs. With the help of the Greeks, traders may assess how sensitive a particular contract is to changes in price, volatility, and time. This is useful since the Greeks help traders adjust to changing market conditions.

The more time an investor has to exercise an option before it expires, the more likely it is that it will be profitable and in the money. This demonstrates that, everything else being equal, longer-dated options are more valuable. Similar to this, more underlying asset volatility raises the possibility of an option expiring in the money. An increase in interest rates should result in an increase in the price of options.

Taking Into Account Particulars:

Marketable versus non-marketable options must be valued using different methodologies. Real traded options are valued in the open market, and like the value of any other asset, this value may differ from what is thought of as the theoretical value of the option. Having access to the theoretical value of the options allows traders to assess their odds of profiting from trading such options.

Generally speaking, the pricing model that Fischer Black and Myron Scholes published in 1973 is credited with being the impetus for the growth of the modern options market. The Black-Scholes formula is frequently used to estimate a theoretical price for a financial instrument whose maturity date is known. However, this is not the only model that is offered. Also frequently employed are the Monte-Carlo simulation and the Cox, Ross, and Rubinstein binomial option pricing model.

Applying the Black-Scholes Model of Option Pricing:

Five factors had to be entered into the original Black-Scholes model: the option's striking price, the stock's current price, the remaining time before it expires, the risk-free rate of return, and volatility. Future volatility must be estimated or inferred because it is challenging to make a firsthand observation of it. Implied volatility is so distinct from historical volatility or volatility that actually occurred.

The Black-Scholes model, which is widely regarded as one of the most reliable approaches to pricing, assumes that stock prices follow a log-normal distribution since asset values can never go below zero. The model further assumes that there are no transaction fees or taxes, that the risk-free interest rate is constant for all maturities, that the funds from short sales of securities may be used for other purposes, and that there are no chances for risk-free arbitrage. These additional presumptions are made.

It is quite evident that even the great majority of the time, not all of these assumptions are true. The model, for instance, assumes that the underlying volatility of the option won't vary over the length of its existence. Since volatility varies according to the amount of supply and demand, this is an absurd expectation that is rarely, if ever, even close to being true.

The implied volatility for options is represented graphically throughout the range of strike prices for options with the same expiration date as the volatility skew. As a result, some changes will be made to the option pricing models to account for the volatility skew. The resulting shape frequently exhibits a skew, sometimes known as a "smile," which shows that the implied volatility values for options that are more out of the money (OTM) have higher values than those for options with a strike price that is more closely aligned with the price of the underlying asset.

The Black-Scholes model also assumes that the options being evaluated

are of the European type, which means they can only be exercised after reaching maturity. American-style options may be exercised at any time up until the day of expiration, including on the day of expiration itself, although this is not taken into account by the model. On the other hand, the binomial and trinomial models can handle every type of option since they can calculate the value of the option at any given time during the course of its existence.

Options sensitivity to different variable

Greeks is a term used in the options market to describe the various types of risk associated with holding a position, whether it be in a single option or a portfolio of options. Since the Greek script is frequently employed to describe the notions that these variables represent, they are known as Greeks. Each risk factor results from a flawed premise or an inadequate connection between the option and one or more underlying factors. Using a range of Greek values, traders assess the risk of options and manage option portfolios.

DELTA

The term "delta" (Δ) denotes the rate of change between the option's price and a one-dollar increase or decrease in the value of the underlying asset. In other words, the degree to which changes in the price of the underlying affect the option's price. A call option's delta can have a value between 0 and 1, whereas a put option's delta can have a value between 0 and -1.

Consider the situation of a trader who holds a call option with a delta of 0.50. As a result, the price of the option could climb by as much as fifty cents if the price of the underlying stock rose by one dollar.

Option traders utilise delta, commonly referred to as the hedging ratio, to attain a delta-neutral position.

If you purchase a traditional American call option with a delta of 0.40, you will need to sell 40 shares of stock in order to fully hedge your position. The net delta of an options portfolio can also be used to calculate the hedging ratio for that portfolio.

Finding the current likelihood that the option will expire with a positive intrinsic value is a less common use of an option's delta. As an illustration, a call option with a delta of 0.40 today has a 40% stated chance of expiring in the money.

THETA

Theta (Θ) represents the temporal sensitivity, or rate of change between the option price and time. The time decay of an option is another name for this variable. Theta is the percentage that, if all other variables remained constant, the price of an option would decrease with the length of time left before it expired.

Consider an investor's position who possesses a long option with a theta of -0.50 . The cost of the alternative would decrease by 50 cents per day if all other factors stayed constant. If the option was not exercised within three trading days, its value could decrease by \$1.50.

When an option's strike price is closer to its inherent value, theta increases; when it is further from its intrinsic value, theta decreases. The temporal decay of options that are approaching their expiration date is likewise speeding up. When dealing with long calls and long puts, theta is frequently negative. On the other hand, due to their shortness, short calls and short puts both have positive Theta. A stock, for instance, is said to have a Theta value of zero if it continues to increase in value over time.

GAMMA

The Greek letter gamma (Γ) stands for the rate of change that occurs between an option's delta and the price of the underlying asset. This kind of price sensitivity is referred to as second-order or second-derivative price sensitivity. The value of gamma reveals how much the delta would shift in response to a change of one dollar in the underlying investment.

Suppose an investor purchased one call option and is currently in the black on the fictitious commodity XYZ. According to the Greek letters, the call option has a delta of 0.50 and a gamma of 0.10. Therefore, a \$1 gain or decrease in the price of stock XYZ would cause a 0.10 increase or decrease in the delta of the corresponding call option.

The element that is utilised to evaluate the consistency of a given option's delta is gamma. The delta may change dramatically in response to even relatively small changes in the price of the underlying asset, according to higher gamma values. Gamma grows larger as the expiration date approaches and is highest for options that are more likely to be "at the money" compared to options that are either more likely to be "in the money" or more likely to be "far from the money."

Gamma levels are normally lower the further away you are from the expiration date. This corresponds to choices having longer expiration dates being less sensitive to delta changes. Gamma levels tend to rise as the expiration date approaches because the impact of price movements on gamma becomes more pronounced.

Option traders who want to be delta-gamma neutral may choose to hedge not just the delta but also the gamma. This indicates that the delta will remain generally steady at a value close to zero regardless of how much the underlying price moves.

VEGA

The rate of change between an option's value and the implied volatility of the underlying asset is represented by the variable Vega (V). The sensitivity of the option to volatility changes is seen by this. The Vega

value indicates how much an option's price changes in reaction to a 1% change in its implied volatility.

For example, a Vega of 0.10 indicates that the option's value is expected to change by 10 cents if the implied volatility rises by 1%.

An increase in the underlying instrument's volatility raises the option's value directly since it means that the underlying instrument is more likely to experience values that are at either extreme. On the other side, if the volatility of the underlying asset decreases, the option's value declines. Vega has achieved its maximum level for options that are currently profitable but have some time left before they expire.

RHO

The symbol Rho (ρ) denotes the rate of change that occurs between the value of an option and a change of one percentage point in the interest rate. This determines how sensitive the asset is to changes in the interest rate. Take, for instance, a call option with a price of \$1.25 and a rho of 0.05 as an example. If there is no change to any other factor, the value of the call option would remain the same at \$1.20 even if there was a 1% increase in interest rates. For put options, the situation is exactly the reverse. The best use of Rho is for options that are already profitable but have a long way to go before they expire.

5.5 SUMMARY

- Put-call parity provides an iron law connecting the values of put and call options without instructing us on how to price either, making it a typical illustration of arbitrage-based pricing.
- In accordance with the put-call parity, the price difference between a call option and a put option with the identical terms should be equal to the value of the underlying asset less the present discounted value of the exercise price.
- In finance, the binomial options pricing model offers a generalizable numerical method for valuing options.
- The binomial model was first put forth by Cox, Ross, and Rubinstein in 1979.
- The Black-Scholes model, also referred to as Black-Scholes, illustrates how the cost of financial instruments, especially stock options, varies over time.

5.6 UNIT End Questions

A. Descriptive Questions:

Short Answers:

1. Explain in detail Black-Scholes option pricing.

2. Explain in detail binomial option pricing model.
3. Discuss acquiring knowledge of the Option Pricing Theory.
4. Write note on DELTA.
5. What is THETA?

B. Fill in the blanks:

1. The value of theta (Θ) denotes the rate of change between the option price and time, also known as
2. The Greek letter gamma is denoted by.....
3.indicates the sensitive of option in respect to changes in volatility.
4. The rate of change that occurs between the value of an option and a change of one percentage point in the interest rate is
5. The binomial option pricing model makes use of an iterative approach, which enables the definition of nodes, also known as.....

Answers:

1 timesensitivity, 2- Γ , 3- VEGA, 4-RHO, 5- points in time

5.7 REFERENCES

References book

- Derivatives Market NCFM Module. National Stock Exchange India Limited Publications : Bombay : 2007.
- Gupta S. L (2007). Financial Derivatives Prentice Hall. New Delhi.
- Indian Stock Market Review. National Stock Exchange Publications.
- Jaynath Rama Varma (2008). Derivatives and Risk Management. Tata Mc Graw Hill Publications : New Delhi



RISK MANAGEMENT

Unit Structure

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Hedging Using Greeks (Delta - Gamma Hedging)
- 6.3 Hedging with Futures (Strategies of Hedging, Speculation And Arbitrage)
- 6.4 Advantages and disadvantage of Risk Management
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- 6.7 Reasons for Managing Derivatives risk
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- 6.9 Summary
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6.0 LEARNING OBJECTIVES

After studying this unit, you will be able to:

- Describe hedging using Greeks (Delta - Gamma hedging)
- Explain hedging with futures
- Describe strategies of hedging
- State the benefits of speculation and arbitrage in futures
- Define index options and futures
- Describe VaR and historical simulation
- Discuss risk management structure and policies in India

6.1 INTRODUCTION

What Is Risk Management?

Risk management is the process of recognising, assessing, and either accepting or mitigating the effects of uncertainty in investment decision-making. In its most basic form, risk management is the process by which a fund manager or investor examines and attempts to quantify the possibility of losses in an investment, such as a moral hazard, and then determines

whether to take the appropriate action (or not) in light of the fund's investment objectives and level of risk tolerance.

Risk and reward are mutually exclusive. There is always some risk associated with investments, whether it be nearly zero in the case of a U.S. T-bill or overly high in the case of something like emerging-market stocks or real estate in an inflationary environment. Risk can be measured in absolute or relative terms depending on the circumstance. Investors may find it advantageous to have a wide grasp of risk in all of its numerous manifestations in order to better appreciate the potential outcomes, trade-offs, and costs linked to the various investing approaches.

- Recognising, assessing, and either accepting or mitigating the effects of uncertainty in financial decision-making is the process of risk management.
- In the realm of finance, return cannot be calculated without taking risk into account.
- One of the most popular methods for assessing risk is the use of standard deviation, a statistical indicator of dispersion relative to a central tendency.
- The volatility of a single stock, also known as its systematic risk, is compared to the volatility of the entire market using a statistic called beta, which is frequently referred to as market risk.
- Money managers that employ active methods in an effort to outperform the market are susceptible to alpha risk because alpha is a gauge for excess return.

Risk management is the process of identifying, assessing, and mitigating potential risks in order to protect assets, investments, or business operations. It involves analyzing uncertainties and implementing strategies to minimize the negative impact of risk events and maximize opportunities.

- Risk identification: The first step in risk management is identifying and recognizing potential risks. This involves assessing internal and external factors that could lead to adverse outcomes. Risks can be categorized into various types, such as operational, financial, strategic, compliance, legal, or reputational risks.
- Risk assessment: Once risks are identified, they need to be evaluated to understand their potential impact and likelihood of occurrence. This step involves analyzing the probability of risks happening and assessing the potential magnitude of their impact. Risk assessment helps prioritize risks and determine where resources should be allocated for mitigation.
- Risk mitigation: Risk mitigation involves developing strategies to reduce the likelihood or impact of identified risks. This can include implementing control measures, establishing risk management policies

and procedures, diversifying investments, hedging against potential losses, or transferring risk through insurance or contracts. The goal is to proactively manage risks and minimize their potential negative consequences.

- **Risk monitoring:** Risk management is an ongoing process that requires continuous monitoring and evaluation. Regularly assessing the effectiveness of risk mitigation strategies and monitoring changes in the risk landscape allows for timely adjustments and adaptations. This includes staying updated on industry trends, regulatory changes, and emerging risks that may impact the organization or investment portfolio.
- **Risk communication:** Effective risk management involves clear and transparent communication of risks to stakeholders, including management, employees, investors, and customers. Open communication channels facilitate a shared understanding of risks and encourage proactive risk management efforts throughout the organization. Risk communication also helps manage expectations and build trust.
- **Risk response planning:** In addition to mitigating risks, organizations should also develop plans for responding to risk events if they occur. This includes establishing protocols and procedures to address and recover from risk incidents, ensuring business continuity, and minimizing disruptions.
- **Risk culture and awareness:** Risk management is not solely the responsibility of a dedicated risk management team. It is important to foster a risk-aware culture throughout the organization, where employees at all levels are educated about risks, encouraged to report potential risks, and empowered to contribute to risk mitigation efforts. Promoting risk awareness and integrating risk management into decision-making processes strengthens the organization's resilience.

How Risk Management Works:

Risk management works by systematically identifying, analyzing, and addressing potential risks to minimize their impact on an organization or investment portfolio. Here's a step-by-step overview of how risk management typically works:

- **Risk identification:** The first step is to identify and understand the risks that could affect the organization or investment portfolio. This involves conducting risk assessments, reviewing historical data, analyzing industry trends, and engaging with stakeholders to identify potential risks.
- **Risk assessment:** Once risks are identified, they need to be assessed in terms of their potential impact and likelihood of occurrence. This step involves evaluating the severity of each risk and estimating the probability of it happening. Various tools and techniques, such as risk

matrices or qualitative/quantitative analysis, can be used for risk assessment.

- **Risk prioritization:** After assessing the risks, they need to be prioritized based on their significance and potential impact. This helps determine which risks require immediate attention and allocation of resources for mitigation.
- **Risk mitigation:** Risk mitigation involves developing strategies and implementing measures to reduce the likelihood or impact of identified risks. This can include implementing controls, establishing risk management policies and procedures, diversifying investments, hedging, or transferring risk through insurance or contracts.
- **Risk monitoring and control:** Once risk mitigation strategies are in place, it is crucial to continuously monitor the risks to ensure the effectiveness of the implemented measures. Regular monitoring helps identify changes in risk profiles, detect emerging risks, and assess the performance of risk controls. Adjustments to risk management strategies can be made based on the monitoring results.
- **Risk reporting and communication:** Effective risk management involves clear communication of risks and their status to relevant stakeholders. This includes regular reporting to management, boards of directors, investors, and other stakeholders. Transparent communication enables informed decision-making, fosters accountability, and ensures a shared understanding of risks across the organization.
- **Risk review and improvement:** Risk management is an ongoing process that requires periodic review and improvement. Regular evaluations and audits of risk management processes help identify areas for improvement, assess the effectiveness of risk controls, and align risk management practices with changing business or market conditions.
- **Integration with decision-making:** Risk management should be integrated into the decision-making processes of an organization or investment strategy. This ensures that risks are considered when making strategic choices, setting objectives, and evaluating potential opportunities.

Risk management and psychology:

Risk management and psychology are closely intertwined as human behavior and cognitive biases play a significant role in how risks are perceived, evaluated, and managed. Here are some key aspects of the relationship between risk management and psychology:

- **Perception of risk:** The way individuals perceive and interpret risks can be influenced by psychological factors. People may overestimate or underestimate certain risks based on their personal experiences,

emotions, biases, and heuristics. Understanding these cognitive and emotional factors is crucial for effective risk management as it helps identify potential gaps in risk perception.

- **Behavioral biases:** Behavioral biases are systematic patterns of deviation from rational decision-making that can affect risk management. Common biases include loss aversion, where individuals emphasize avoiding losses more than acquiring gains, and overconfidence, where individuals tend to overestimate their abilities and underestimate risks. These biases can lead to suboptimal risk assessment and decision-making if not recognized and addressed.
- **Risk tolerance and risk appetite:** Risk tolerance refers to an individual's or organization's willingness and ability to take on risk, while risk appetite refers to their desired level of risk exposure. These concepts are influenced by psychological factors such as risk aversion, financial goals, past experiences, and emotional biases. Understanding these psychological drivers is important for aligning risk management strategies with the risk preferences of stakeholders.
- **Decision-making under uncertainty:** Risk management involves making decisions in the face of uncertainty. Psychological factors, such as ambiguity aversion and the framing effect, can influence how decisions are made. For example, individuals may be more risk-seeking when decisions are framed in terms of potential gains rather than losses. Understanding these biases can help in designing effective decision-making processes and risk management strategies.
- **Herd behavior and group dynamics:** Human beings are social creatures, and herd behavior can impact risk management. People often look to others for guidance and tend to follow the actions of the crowd, even if it may not be rational. This can lead to the underestimation or neglect of certain risks. Recognizing the influence of group dynamics and promoting independent thinking within risk management processes can help mitigate the impact of herd behavior.
- **Emotional factors and risk aversion:** Emotions can significantly impact risk management. Fear, anxiety, and other emotions can lead to risk aversion and a preference for certainty, potentially hindering the ability to take calculated risks. Conversely, excessive optimism or greed can lead to excessive risk-taking. Effective risk management requires acknowledging and managing emotional factors to ensure rational decision-making.
- **Communication and risk framing:** Effective communication is crucial in risk management. The way risks are communicated can influence how they are perceived and understood by stakeholders. The framing of risks, the use of visual aids, and clear, concise messaging can help overcome psychological barriers and improve risk comprehension.

6.2 HEDGING USING GREEKS (DELTA-GAMMA HEDGING)

What Is Gamma Hedging?

Gamma hedging is an options trading strategy that aims to manage the risk associated with changes in the delta of an options position. Delta measures the sensitivity of an option's price to changes in the price of the underlying asset. Gamma, on the other hand, measures the rate at which the delta of an option changes as the price of the underlying asset moves.

When an options trader engages in gamma hedging, they take offsetting positions in the underlying asset or other options contracts to maintain a neutral or desired delta position. The purpose of gamma hedging is to minimize the impact of changes in the underlying asset's price on the overall options position.

KEY TAKE AWAYS:

- Gamma hedging is a sophisticated options strategy that can be used to lessen the exposure of an option position to significant changes in the underlying securities.
- Gamma hedging is also employed at option expiry to guard against the effects of abrupt changes in the price of the underlying asset that could happen as the option's expiration date approaches.
- Gamma and delta hedging are frequently used in conjunction with one another.

How the Gamma Hedging Strategy Operates:

- **Initial position:** The trader starts with an options position, which includes a combination of call and/or put options on a particular underlying asset.
- **Delta monitoring:** As the price of the underlying asset changes, the delta of the options position also changes. The trader closely monitors the delta to track the sensitivity of the options to changes in the asset's price.
- **Adjusting the hedge:** When the delta changes, the trader executes offsetting trades in the underlying asset or other options to adjust the delta back to the desired neutral position. This involves buying or selling the underlying asset or options contracts in such a way that the overall delta of the position remains within the desired range.
- **Delta-neutral position:** The goal of gamma hedging is to maintain a delta-neutral position. A delta-neutral position means that the overall delta of the options portfolio is zero or close to zero, indicating that the options position is less sensitive to changes in the underlying asset's price.

- **Continuous monitoring and adjustment:** The trader continues to monitor the delta and gamma of the options position and adjusts the hedge as needed. This ensures that the overall position remains delta-neutral and mitigates the risk of significant losses due to changes in the underlying asset's price.

Gamma hedging is particularly useful in situations where options traders want to manage their exposure to price movements while maintaining a specific risk profile. By adjusting the delta through gamma hedging, traders can potentially reduce the impact of price changes and achieve a more stable options portfolio.

Gammavs. Delta:

Gamma is a common variable in the Black-Scholes Model, which was the first formula to be accepted as a benchmark for pricing options. The name of this variable was derived from the Greek characters.

The rate at which the delta of an option changes in response to changes in the price of an underlying stock or other asset is measured by gamma. Gamma can also be used to define the rate at which an option's delta changes. The simplest definition of gamma is the rate of change in the price of an option. Gamma, on the other hand, is also thought of by some investors as the projected price shift that comes after the second successive one-dollar change in the price of the underlying asset. Consequently, to the first equation, you would need to add gamma and delta.

Delta-GammaHedging:

In order to lessen the risk of changes in the underlying asset as well as the risk of changes in the delta itself anytime the underlying asset is in motion, one type of options technique called delta-gamma hedging combines delta hedging with gamma hedging. When delta hedging is utilised alone, a position is protected from even little fluctuations in the value of the underlying asset. However, substantial changes will result in the hedge shifting (changing the delta), leaving the position exposed to risk. Even after a gamma hedge is added, the delta hedge is kept in place.

Every time the delta of the underlying asset changes when an investor utilises a gamma hedge in addition to a delta hedge, the investor must create new hedges. The number of underlying shares that are bought or sold in the context of a delta-gamma hedge depends not only on whether the price of the underlying asset is rising or dropping, but also on how much it is changing.

When making a transaction, a trader who is seeking to be delta-hedged or delta-neutral would often make a trade that has very little change depending on the short-term price volatility of a lesser magnitude. A trade of this kind is often a wager on the likelihood that volatility, or, to put it another way, demand for the options associated with that asset, would trend towards a major increase or decrease in the future. However,

evening delta hedging will not provide a great deal of protection for an options trader on the day before the contract expires. On this day, the effect of even a moderate price movement in the underlying asset might produce extremely big price fluctuations in the option. This is due to the fact that there is such little time

remaining before the option expires. Under these conditions, delta hedging is not an adequate risk management strategy.

Gamma hedging is a strategy that is combined with delta hedging to safeguard the trader from more significant than anticipated changes to a security or perhaps the entire portfolio. Gamma hedging is most frequently employed, nevertheless, to guard against the effects of a sudden change in the option's price after the time value has almost entirely depleted.

6.3 HEDGING WITH FUTURES (STRATEGIES OF HEDGING, SPECULATION AND ARBITRAGE)

Comparing Hedging and Speculation : An Overview:

The phrases "speculators" and "hedgers" are used to designate a specific type of trader or investor. Both hedging and speculating are strategic investing practices. Although speculating and hedging are both rather intricate strategies, they couldn't be more dissimilar from one another.

In contrast to speculating, which aims to benefit from a security's price shift, hedging attempts to reduce the risk or volatility associated with a security's price variation.

An investor may lessen the risk of price swings associated with the asset in question by taking positions in an asset that are symmetrical to those that the investor already has, a practice frequently referred to as "hedging." The fundamental objective of speculation, in contrast, is to generate profits through the placement of wagers on the future course of an asset.

KEY TAKE AWAYS:

- Hedging and speculating are two separate types of investing strategies.
- Hedging, often known as "offsetting positions," is a strategy used to reduce price volatility associated with a certain asset by holding holdings that are the opposite of those that an investor already holds.
- Speculation is the action of trying to profit from a security's price fluctuation and is more vulnerable to market gyrations.
- Conversely, hedgers are viewed as risk-averse, whilst speculators are perceived as risk-takers.
- Hedging and diversity, though they are two separate tactics, both work to lower risk through counter balancing and other strategies.

HEDGING

Investors may occasionally take what is known as a "offsetting position" in an investment to protect themselves against future gains or losses in the value of the underlying asset. The stance that supports the derivative is also frequently referred to as the opposing position. By keeping a position that is against the market's expectation in the hopes of "covering all their bases," hedgers try to protect themselves from the asset's price shifting in any direction.

The ideal situation when it comes to hedging would be to figure out a method to have one consequence balance out another. It is a method designed to lessen or get rid of risk.

Consider a company that specialises in the manufacture of jewellery and has a substantial order that is due in six months and requires a sizable quantity of gold. The company is worried about the volatility in the gold market and anticipates that gold prices will probably increase dramatically in the not too distant future. To protect itself against the danger brought on by the uncertainty, the firm has the option of buying a gold futures contract for a six-month term. In this way, if the price of gold increases by 10%, the futures contract will lock in a price that is high enough to cover the increase.

As can be seen, hedgers are protected from any possible losses, but this protection means that their prospective earnings are constrained. Despite being diversified, the portfolio is never the less exposed to systemic risk. A corporation may choose to hedge against specific business operations in order to smooth out fluctuations in its profit and safeguard itself from any potential losses, taking into account its internal regulations and the nature of the business it conducts.

The investor hedges their portfolio by selling short futures contracts on the market and buying put options as a hedge against their long holdings in order to lessen the impact of this risk on their investments. However, if a speculator is paying attention to this situation, they may want to think about shorting an exchange-traded fund (ETF) and a market futures contract in order to potentially profit from a decline in the market price.

SPECULATION

Speculation refers to the act of engaging in risky financial transactions or investments with the aim of profiting from short-term price fluctuations or market movements. Speculators typically take positions in assets such as stocks, bonds, commodities, currencies, or derivatives, with the expectation of capitalizing on price changes.

- **Timeframe:** Speculation focuses on short-term price movements and takes advantage of market inefficiencies or perceived opportunities. Speculators often aim to profit from price fluctuations over days, weeks, or months, rather than holding assets for the long term.

- **Risk and Reward:** Speculation involves a higher level of risk compared to traditional investment strategies. Speculators seek above-average returns, but they also face the potential for significant losses. The risk-reward tradeoff in speculation is generally higher due to the short-term nature of positions and the potential volatility of markets.
- **Information and Analysis:** Speculators rely on various sources of information, market analysis, and forecasting techniques to make informed decisions. They may consider technical indicators, fundamental analysis, market sentiment, and other factors to assess potential price movements and identify trading opportunities.
- **Leverage and Derivatives:** Speculators often use leverage, which involves borrowing funds to amplify potential returns. Leverage can increase profitability but also magnify losses. Additionally, speculators may utilize derivatives such as options, futures, or contracts for difference (CFDs) to gain exposure to underlying assets without owning them directly.
- **Market Liquidity:** Speculators tend to operate in liquid markets where buying and selling assets can be easily executed. Higher liquidity allows for efficient entry and exit from positions, enabling speculators to respond quickly to market developments and capitalize on price movements.
- **Market Participants:** Speculators can include individual traders, hedge funds, proprietary trading firms, and institutional investors. They play a role in providing liquidity to markets and contribute to the price discovery process.
- **Market Efficiency:** Speculation is based on the belief that markets are not always perfectly efficient and that there are opportunities to profit from mispriced assets. Speculators seek to exploit market inefficiencies and generate profits by correctly predicting short-term price movements.

ARBITRAGE

Arbitrage is something that can be seen pretty often among institutional investors and hedge funds, and it carries a manageable level of risk. A big holding in a securities that is traded in two distinct marketplaces at different prices is required for this sort of approach to be implemented successfully. The investor will purchase it at a low price on one market and then sell it for a price that is somewhat higher on another market; this will allow them to make a profit off of the difference in price between the two markets. As a result of the nature of this method, it is not often used by individual investors working on a small scale. Arbitrage refers to the practice of simultaneously purchasing and selling an item in the hope of making a profit from very minor variations in price. Because of the market's inefficiencies, arbitrage is a strategy that may be used.

The term "arbitrageurs" refers to individuals who routinely purchase stocks on one market, such as the New York Stock Exchange (NYSE), and simultaneously sell those same stocks on another market, such as the London Stock Exchange. The LSE provides an illustration of how arbitrage operates. In contrast to London, where the stock would be traded using British pounds, the stock would be traded in the United States using US dollars. This typically happens very quickly, and once it has been taken advantage of, the opportunity is gone.

A number of variables, such as market inefficiencies, pricing discrepancies, and even changes in the dollar-to-pound exchange rate, could momentarily affect the values of the same stock. Arbitrage is not always limited to using the same instrument. Contrarily, arbitrageurs have the opportunity to profit on the expected correlations between similar financial instruments, such as gold futures and the price at which actual gold is exchanged.

When carried out properly, arbitrage, which is buying and selling an asset at the same time, essentially serves as a form of hedging and subjects its participants to a low amount of risk. Keep in mind that constrained does not always equate to inconsequential. Even though there is a chance that losses could result from very small price changes, other risks, such a drop in the value of a currency, could be far more serious. Traders must alter their conditions in order to increase their chances of profiting from arbitrage because it carries some risk.

Arbitrageurs frequently take very large stakes in the markets because they want to profit from relatively small price fluctuations. Due to their significant market holdings, individual investors frequently choose not to engage in arbitrage. On the other hand, the most frequent users of this strategy are hedge funds and other significant institutional investors.

6.4 ADVANTAGES AND DISADVANTAGE OF RISK MANAGEMENT PROCESS

Advantages of Risk Management:

The process of risk management is regarded as a crucial discipline that the business has developed recently. Businesses frequently recognise the benefits of enterprise risk management. A few advantages of risk management in projects are listed below:

1. Benefits of risk identification:

Risk assessment contributes to the promotion of alertness in times of peace and calm in times of disaster. It implies that every risk from the past that is most likely to occur is planned to happen without any underlying presumptions.

The majority of incidents frequently fall under these positive risks. It assists in reducing opportunity risks so that one is aware of impending issues.

2. Benefits of risk assessment:

It focuses on the activities that have been recognised as assisting with a project's or business's effect. The primary focus of this phase is on the concepts that the stakeholders have investigated. The ability to handle resolved difficulties with a greater selection of alternative solutions is the biggest advantage.

3. Treatment of risks:

It assists in controlling personal risks, which are necessary for implementing a strategy. Internal compliance is put into place and used to mitigate the effects of the stopped acts.

Lack of preparation results in the opportunity being wasted, which is made even clearer by the profitable data that internal controls liberate.

4. Minimization of risks:

The company operations foresee the risks that are taken into account in the offered assessment plans. It allows for quicker updating of policies and contingencies that have been successfully applied inside the mapped business functions.

Here, the cost-benefit analysis needs to be revised due to the risk ownership. It focuses on the alteration of rules within the complex structural behaviour.

5. Awareness about the risks:

The phrases that stand out in this context will increase awareness among the planned terms of risks and lead to a successful analysis and evaluation of exercising the risk module.

It enables one to concentrate on the risk management strategies built into the lessons gained and scheduled into a lack of preparation. There are additional phases for each module within the identified data.

6. Successful business strategies:

The most current state determines the grade points, and the risk management plan is a continuous process. From inadequate planning, preparation, and successful execution of all tactics, there are numerous stages that range in severity.

The decrease of negative risks results in operational effectiveness. It has varying policies regarding how commerce is conducted and how therapy is delivered.

7. Saving cost and time:

Projects and other firm strategies are at risk because of the task that is prioritised over them. As a result, the costs that are accumulated within the

used things are always saved. It decreases waste and the time needed to prepare for fighting fires.

8. New opportunities:

The opportunities are growing because of the new ways of discussing the unresolved difficulties.

Most of the scenarios match up with their least significant component and aggregate. It gets ready for new projects and the demanding inputs that go along with them.

9. Harvesting knowledge:

The knowledge of the stakeholder's experience with the preemptive approach, which is employed for the unprepared threats and which provides a template to deal with the ready-made risks, must be applied in this situation.

It has continual tactics that are used from the start to the point of widespread comprehension.

10. Safeguarding resources

The risk management strategies and tactics outlined below help to protect the organization's assets. This promotes the resources rather than utilising them unlawfully.

Among the flexible alterations to the employee options, it also offers safety with the other resources. It develops rerouting process production and backup plans.

11. Improvement in credit ratings:

The increase in credit ratings causes many organisations that support the finished operations to change, which reduces budget investments.

It has increased confidence issues as a result of its capital volatility, particularly with stakeholders. It aims to provide a variety of commercial aspects that actually provide benefits.

12. Compliance with regulations

This framework complies with regulatory criteria. It collects measures and handles hazards. Better credit features are now simpler to acquire thanks to this improvement.

In terms of capital turbulence and even the grading standards applied to the paid business plans, it also generates improved efficiency. The insured firm experiences a rise in stakeholder confidence as a result.

13. Values shareholders:

It focuses on the ability of the shareholder who makes a major contribution to management and assumes the key roles that the company can play in extending credit.

It features the precise decision-making procedure used in the present models as well as the anticipated hiring of regulatory personnel.

14. Risk possibilities:

It identifies the plainly visible risk potentials that are under control based on the significance or impact of the organization's updated risk management plans. The actual balance sheets that support the risk management culture are revealed.

It alters the desired data as well as the approach to balancing insight and determining compatibility. It supports all of the requirements for a typical plan.

15. Faster competition:

If the organisation makes contributions at multiple budget levels utilising individuals with a variety of skill sets, the organisation will be more committed to the task.

It gains a competitive advantage on the better logic schedules. Risk management is at its most complex level. These contests are held in the midst of all of life's highs and lows.

16. Offers assistance:

It helps the company manage the risks connected to both the success and failure of financial plans.

The benefits of financial risk management in this case are not completely appreciated, both in terms of boosting the likelihood of making the acquisition and achieving a potential breakthrough in the supply chain. It has provided concentrated support for the chances of executing the financial actions that were budgeted.

17. Identification of risks:

A risk management system assists in identifying the threats that have a precise network in order to determine the best strategy to manage risks. It has a greater potential for the risks related to putting the provided advise into practise.

When the risks are identified, the entire company provides thorough support. It will be simplified and improved within the challenging elements.

18. Provides guidance:

It offers advice in advance on analysing the risks that are modelled within the strategies of risk and using the framework that is enabled within the experience.

It has developed cutting-edge risk management strategies that are connected to other risks and the effects of newly acquired knowledge.

19. Identification of possible threats:

This identification provides uninteresting tasks to make up for it and motivate personnel to learn about the resulting changes.

Research and the development of strategies for maintenance implementation take time. It helps the staff become accustomed to the scheduled time.

20. Reduces impact and loss:

When there is a pre-planned schedule or an object loss, risk management procedures are more clearly specified. It makes stress and concern worse in some ways. When they are assembled, complexity matters.

Here, it guarantees that the business will receive all potential results of the impartial assessments that are examined while taking on problems.

21. Stability of earnings:

The business operations that are held within the next operation level will concentrate more on the scheduled amount of data.

It reduces the impact of business activities. Employees will be retrenched so as to keep in the comfort zone.

Disadvantages of Risk Management Process:

Managing risks results in time loss as compensation for projects. It convinces projects that are reciprocal to increase the money in the business. It is used for the investigation and advancement of the specified problems that support project management.

1. Complex calculations:

It reduces the impact of business activities. Employees will be retrenched so as to keep in the comfort zone

Complicated calculations are necessary when it comes to risk management. Without automated technologies, estimating risks becomes difficult in every circumstance.

2. Unmanaged losses:

If a loss is interfered with by the firm, such compensation will be given to the company's pay loss.

The organisation in this instance is responsible for the loss that happened as a result of a flawed risk management schedule.

3. Ambiguity:

Even if the uncertainty causes a loss, the people must make up for it from discounts within the allocated amount and even take unnecessary insurance discounts into account.

4. Depends on external entities:

Typically, risk management depends on outside information and outside parties that are controlled within the company.

It offers all necessary information regarding the risks provided by other trustworthy sources. The transferrable resources are dependent on other parties who frequently possess data.

5. Mitigation:

Typically, risk management is made better by mitigating losses from concealed financial impairment. As a result, accepting riskier data and rare business losses result.

6. Difficulty in implementing:

Information about strategic strategies is difficult to acquire for risk management. According to monetary values, it has universal norms that are moderated and approved.

It is compatible with a firm understanding without current experience and the necessary amount of data.

7. Performance:

Risk management keeps control over prospects inside each issue because it can only be dealt with subjectively. It is identifiable by the difficult controls implementation.

The incomplete cost-benefit analysis is managed. This process is mainly concerned with establishing controls.

8. Potential threats:

These potential threats need to be carefully maintained if they're to organise and disappear from the market. This tactic reduces risk while enhancing control over it proportionally.

For project risk management, each method has advantages and disadvantages of its own. Therefore, focusing on risk-mitigation tactics that benefit risk-takers is essential for developing an efficient risk management system. The objective is to decide how to employ the full management structure to tackle upcoming risks.

Risk management becomes a significant concern when a corporation has defined objectives in addition to potential risks, damages, and vulnerabilities.

6.5 RISK MANAGEMENT PROCESS

The risk management process involves a systematic approach to identifying, assessing, mitigating, and monitoring risks within an organization. While specific steps may vary depending on the context and industry, the general risk management process typically includes the following stages:

Risk Identification:

- Identify and document potential risks that may affect the organization's objectives, projects, or operations.
- Utilize various techniques such as brainstorming, checklists, interviews, and historical data analysis to identify risks.
- Categorize risks into different types such as strategic, financial, operational, compliance, or reputational risks.

Risk Assessment:

- Evaluate the likelihood and potential impact of identified risks.
- Assess the significance of risks by considering their potential consequences on objectives, financials, resources, or stakeholders.
- Prioritize risks based on their level of severity and potential impact to focus resources on the most critical risks.

Risk Mitigation:

- Develop strategies and plans to manage and mitigate identified risks.
- Determine appropriate risk responses for each identified risk, including avoidance, reduction, transfer, or acceptance.
- Implement control measures, safeguards, or risk mitigation actions to minimize the probability or impact of risks.
- Consider risk transfer mechanisms such as insurance, contracts, or hedging strategies where applicable.

Risk Monitoring and Communication:

- Regularly monitor and review risks to ensure the effectiveness of risk mitigation measures.
- Establish key risk indicators (KRIs) or metrics to track and measure the status of risks.

- Communicate risk information and updates to relevant stakeholders, including management, employees, and external parties as necessary.
- Foster a risk-aware culture by promoting awareness, training, and continuous improvement in risk management practices.

Review and Adaptation:

- Periodically review and reassess the risk management process to identify areas for improvement.
- Incorporate lessons learned from previous risk events or incidents into the risk management framework.
- Stay updated with changes in the internal and external environment that may impact risk profiles.
- Adjust risk mitigation strategies and plans as needed to address emerging or evolving risks.

Effective risk management requires ongoing commitment and involvement from all levels of an organization. It is an iterative process that should be integrated into the overall decision-making and operational processes to ensure risks are proactively identified, assessed, and managed to protect the organization's objectives and enhance its resilience.

6.6 RISK MANAGEMENT STRUCTURE AND POLICIES IN INDIA

In India, risk management structure and policies vary across different sectors and organizations. However, there are certain guidelines and regulations established by regulatory authorities that provide a framework for risk management practices. Here are some key aspects of risk management structure and policies in India:

Regulatory Framework:

- The Reserve Bank of India (RBI) is the primary regulatory authority for risk management in the banking sector. It issues guidelines and directives to banks and financial institutions regarding risk management practices, including credit risk, market risk, liquidity risk, operational risk, and more.
- The Insurance Regulatory and Development Authority of India (IRDAI) oversees risk management in the insurance sector and sets regulations for insurers to manage risks effectively.

Risk Management Committees:

- Many organizations, particularly in the financial sector, establish dedicated risk management committees to oversee and manage risks.

- These committees are responsible for setting risk management policies, reviewing risk exposures, ensuring compliance with regulations, and making informed decisions to mitigate risks.

Risk Management Policies and Frameworks:

- Organizations are required to develop and implement risk management policies and frameworks tailored to their specific industry, size, and risk profile.
- These policies outline the risk appetite of the organization, risk assessment methodologies, risk mitigation strategies, and reporting procedures.
- The policies should align with regulatory requirements and international best practices.

Risk Assessment and Reporting:

- Organizations are expected to conduct regular risk assessments to identify, assess, and quantify risks.
- Risk assessment methodologies may include scenario analysis, stress testing, and sensitivity analysis to evaluate potential impacts on financials, operations, and other aspects.
- Reporting mechanisms are established to communicate risk exposures, mitigation measures, and overall risk profile to relevant stakeholders, including management, board of directors, and regulatory authorities.

Risk Mitigation Measures:

- Risk management policies emphasize the importance of implementing appropriate risk mitigation measures.
- This may involve implementing internal controls, adopting risk transfer mechanisms such as insurance, diversifying risk exposures, and ensuring robust business continuity and disaster recovery plans.

Training and Awareness:

- Organizations in India promote risk management training and awareness programs to build a risk-aware culture among employees.
- Employees are educated about risk management concepts, policies, and procedures to enhance their understanding of risks and their role in mitigating them.

It's important to note that risk management practices can differ across sectors and individual organizations. The specific risk management structure and policies are influenced by industry-specific regulations, best practices, and the organization's risk appetite. Organizations in India are

encouraged to adopt robust risk management practices to strengthen their resilience and protect stakeholders' interests.

Risk Management Policy:

A risk management policy is a formal document that outlines an organization's approach and principles for identifying, assessing, mitigating, and monitoring risks. It serves as a guiding framework that establishes the overall direction and objectives of risk management within the organization. Here are key components typically included in a risk management policy:

Policy Statement:

- The policy begins with a clear statement of the organization's commitment to risk management and its importance in achieving strategic objectives.
- It highlights the organization's risk management philosophy, emphasizing the proactive and integrated approach to managing risks.

Objectives:

- The policy specifies the overarching objectives of the risk management process, aligning with the organization's overall goals.
- These objectives may include protecting assets, enhancing decision-making, ensuring business continuity, and optimizing risk-reward trade-offs.

Scope and Applicability:

- The policy defines the scope of the risk management process, specifying the areas, projects, or activities to which it applies.
- It identifies the stakeholders and individuals responsible for implementing and overseeing risk management activities.

Risk Management Framework:

- The policy establishes the risk management framework, including the methodologies, processes, and tools to be used.
- It may reference industry standards, regulations, or best practices that guide the organization's risk management efforts.

Risk Governance:

- The policy defines the roles, responsibilities, and authorities of individuals and committees involved in risk management.
- It specifies reporting lines, decision-making processes, and escalation procedures for addressing significant risks.

Risk Assessment and Reporting:

- The policy outlines the approach for identifying, assessing, and prioritizing risks within the organization.
- It may detail the criteria, methodologies, and tools to be used for risk assessment.
- Reporting requirements, including frequency, formats, and stakeholders to be informed, are typically addressed in this section.

Risk Mitigation and Control:

- The policy highlights the organization's approach to risk mitigation and control.
- It may provide guidelines for selecting risk response strategies such as risk avoidance, reduction, transfer, or acceptance.
- The policy may also address the establishment of control measures, monitoring mechanisms, and contingency plans.

Risk Monitoring and Review:

- The policy emphasizes the importance of ongoing monitoring and review of risks and risk management activities.
- It may specify key risk indicators (KRIs), thresholds, and triggers for monitoring risk exposure.
- The policy may address the process for regular reviews, updates, and continuous improvement of the risk management framework.

Compliance and Ethics:

- The policy reinforces the organization's commitment to complying with applicable laws, regulations, and ethical standards.
- It may outline specific risk management requirements related to legal and regulatory compliance, as well as ethical conduct.

Communication and Training:

- The policy emphasizes the importance of effective communication and training on risk management.
- It may outline the channels, frequency, and stakeholders for risk communication within the organization.
- The policy may also address training programs to enhance risk awareness and competence among employees.

Policy Review and Approval:

- The policy specifies the process for reviewing, updating, and approving the risk management policy.
- It may outline the roles and responsibilities of individuals or committees involved in the policy review process.

Prescriptions from regulators with reference to the policy of risk management:

In addition to the a fore mentioned, it is required to adhere to the general standards that have been established by the particular regulators who are in charge of managing an organisation. These criteria may be interpreted as follows:

The Companies Act, 2013: Section 134(3)(n) of the Companies Act, 2013 stipulates that a statement addressing the risk management policy of the business must be included in the report of the board of directors of the firm. This requirement is in effect. This policy need to address all aspects of risk, and more specifically, those aspects of risk that might endanger the survival of the firm.

Securities and Exchange Board of India: Regulation 17 of the SEBI (LODR) Regulations, 2015 stipulates that the company's board of directors is responsible for drafting and putting into action the company's risk management strategy. This obligation was given to the directors by the Securities and Exchange Board of India. In addition, the Regulations provide in Schedule II that it is the responsibility of the risk management committee to formulate a comprehensive policy for risk management, which must always contain the following provisions:

- A frame work for the identification of risks, including but not limited to financial, operational, sectoral, sustainability (especially ESG related concerns), information, and cyber security threats.
- The company's strategy for the continuation of its operations.
- Systems for risk mitigation and internal control mechanisms designed to reduce the impact of hazards that have been identified.
- In addition to this, the committee is accountable for monitoring the execution of the risk management policy and conducting regular reviews of the same.

Reserve Bank of India: In the case of non-banking financial companies (NBFCs), the Reserve Bank of India places a particular emphasis on the liquidity risk management approach that must be applied by relevant In order to do this, the board of directors of the NBFC is going to create a policy for the management of liquidity risk that will include the following provisions:

- Method for always sustaining liquidity ; Limits to the amount of risk that may be tolerated at the entity level
- the funding measures that the NBFC should implement in order to keep its liquidity levels stable;
- Prudential limitations;
- Establishment of a system for the periodic examination of the NBFC's liquidity and of the assumptions used in the projection of that liquidity;
- Plan for paying if there are unexpected costs; Framework for stress testing
- Characteristics of management reporting, including its frequency

In addition, non-bank financial companies (NBFCs) and banks are both obliged to establish asset liability committees in order to strike a balance between the two facets of the organisation that are being discussed.

Nevertheless, there is a distinction in their framework, as liquidity is the most stressed point in NBFCs, whereas in the case of banks, the RBI has laid out a more comprehensive "risk appetite framework," which prescribes risks to be managed at an aggregated level and not to be restricted at a specific risk or function. In addition to the other requirements that must be met, the framework mandates that an analysis of risks must be conducted from both a qualitative and a quantitative vantage point. The framework that has been recommended has as its goal the reduction of financial risks, notably those associated with interest rate and liquidity.

The importance of the framework may be understood simply by focusing on the stringent composition and quorum standards that must be met by the risk management committee. In this connection, the Reserve Bank of India (RBI) has also prescribed a "Internal Capital Adequacy Assessment Process" that is in accordance with the Basel regulations and is to be written down at both the individual bank level and the group level in order to analyse important risks that are faced by the banks. Because of the evident fact that banks play an essential part in the circulation of money in the economy, this may be regarded to be the most stringent prescription ever issued by a regulatory body in respect to the framework for risk management.

Insurance Regulatory and Development Authority of India: The regulator, by means of its corporate governance guidelines for insurers, reposed the responsibility of laying down a risk management framework and a risk policy with the risk management committee of the insurer. This responsibility was reposed in the regulator. Particular emphasis has been placed on the control of the fraud risk that the insurer is exposed to.

6.7 REASONS FOR MANAGING DERIVATIVES RISK

- **Risk Mitigation:**

Derivatives, such as options, futures, swaps, and forward contracts, can expose organizations to various risks, including market risk, credit risk, liquidity risk, and operational risk. Managing derivatives risk helps mitigate the potential adverse effects of these risks and protects the organization's financial stability.

- **Hedging:**

Derivatives are commonly used as hedging instruments to offset or reduce risks associated with underlying assets or liabilities. Effective risk management of derivatives allows organizations to hedge against price fluctuations, interest rate changes, currency exchange rate volatility, and other market uncertainties. This helps stabilize cash flows, protect profit margins, and minimize potential losses.

- **Regulatory Compliance:**

Many jurisdictions have specific regulations and reporting requirements for derivatives trading. Proper risk management ensures compliance with regulatory frameworks, reducing the potential for penalties, legal issues, and reputational damage. Compliance also enhances transparency and accountability in financial markets.

- **Financial Stability:**

Derivatives can introduce complexities and interconnectedness in financial markets. Poor risk management of derivatives can contribute to systemic risks and financial instability. Managing derivatives risk helps safeguard the stability of financial institutions, reduces the potential for market disruptions, and promotes overall market resilience.

- **Investor Confidence:**

Effective risk management practices enhance investor confidence and trust in the organization. Investors, both individual and institutional, look for organizations that demonstrate robust risk management capabilities, including the management of derivatives risk. Transparent and prudent risk management practices can attract investors and potentially lower the cost of capital.

- **Competitive Advantage:**

Proper management of derivatives risk can provide a competitive advantage to organizations. It enables them to navigate volatile markets, respond to changing business conditions, and capitalize on opportunities more effectively. Organizations with effective risk management frameworks are better positioned to adapt to market dynamics and make informed strategic decisions.

- **Operational Efficiency:**

Managing derivatives risk involves implementing efficient processes, controls, and systems to monitor, measure, and mitigate risk exposures. This focus on risk management can improve overall operational efficiency, streamline internal processes, and enhance risk-adjusted returns. It helps organizations identify and allocate resources more effectively and efficiently.

- **Long-Term Sustainability:**

Effective risk management of derivatives contributes to the long-term sustainability of organizations. It helps protect the organization's financial health, preserves shareholder value, and supports strategic objectives. By actively managing derivatives risk, organizations can navigate uncertainties, protect against downside risks, and position themselves for sustainable growth.

6.8 TYPES OF RISK IN DERIVATIVE TRADING

In derivative trading, various types of risks are associated with the use and trading of derivative instruments. These risks can arise from market movements, counterparty actions, operational factors, and other sources. Here are some key types of risks in derivative trading:

The use of derivatives is thought to be quite dangerous. When it comes to opinions regarding the risks associated with a derivative transaction, the market is divided on two fronts. Some people question how derivatives might add new risk to the market as they aren't new securities on their own. This argument is accepted by the other side. However, they also claim that derivatives have the ability to concentrate risks to a point where the economy is unable to easily absorb them.

Market Risk

The principal risk of every investment is market risk. Investors make decisions and take positions based on assumptions, technical analysis, or other factors that aid them in making detailed assessments about how an investment is projected to perform.

There is no failsafe method to protect against market risk since all investments are subject to changes in the market, but understanding how much a derivative is affected by market movements may help investors make wise selections. In fact, two key aspects of investment research are estimating the likelihood that an investment will be profitable and assessing the risk/reward ratio of potential losses vs potential returns.

Counterparty Risk

Counterparty risk, commonly referred to as counterparty credit risk, arises when one of the parties to a derivatives trade defaults on the contract, such as the buyer, seller, or dealer. Risk is higher in over-the-counter (OTC)

marketplaces since they are much less regulated than traditional trading platforms.

Margin deposits are necessary on regular trading exchanges, and they must be updated daily through the mark-to-market process, which helps contracts perform. Thanks to the mark-to-market process, pricing derivatives is more likely to accurately reflect current value. Traders can lower counterparty risk by only transacting with dealers they are familiar with and perceive to be trustworthy.

Liquidity Risk

Liquidity risk applies to investors who plan to close out a derivative trade before maturity. Liquidity risk generally refers to a company's capacity to repay debts without experiencing large losses to its operations. To assess the liquidity risk, investors compare the company's liquid assets and short-term liabilities. Businesses with low liquidity risks can quickly turn their investments into cash to halt a loss.

Another important consideration for derivatives-interested investors is the danger of limited liquidity. These investors need to assess whether it will be difficult to close the sale or whether the current bid-ask spreads will be so large that they will be a significant expense.

Credit Risk:

Credit risk is the risk of financial loss resulting from the failure of a counterparty to fulfill its contractual obligations. In derivative trading, credit risk arises when one party fails to make payments or fulfill its obligations under the derivative contract. This risk becomes significant when trading with counterparties of lower creditworthiness or during periods of financial stress.

Operational Risk:

Operational risk relates to the risk of loss resulting from inadequate or failed internal processes, people, systems, or external events. In derivative trading, operational risk can arise from errors in trade processing, settlement failures, technology disruptions, inadequate controls, fraud, or regulatory compliance failures. Robust operational risk management practices are crucial to mitigate such risks.

Legal and Regulatory Risk:

Legal and regulatory risk arises from non-compliance with applicable laws, regulations, and contractual obligations. It includes the risk of legal disputes, regulatory sanctions, changes in regulations, and the impact of new laws or court decisions on derivative contracts. Organizations need to stay updated with relevant regulations and maintain compliance to mitigate legal and regulatory risks.

Model Risk:

Model risk refers to the risk of losses arising from the use of imperfect or inaccurate models to price, value, or manage derivatives. Derivative pricing models rely on assumptions, mathematical formulas, and historical data, and they may not fully capture complex market dynamics or unforeseen events. Organizations need to assess and manage model risk to ensure the reliability and accuracy of derivative pricing and risk management.

Systemic Risk:

Systemic risk refers to the risk of widespread disruption or instability in financial markets caused by interconnectedness and interdependencies among market participants. It can arise from factors such as major market shocks, economic crises, policy changes, or failures in the financial system. Systemic risk can impact derivative trading by amplifying market volatility and counterparty risks.

6.9 SUMMARY

- Risk management is the process of recognising, assessing, and either accepting or mitigating the effects of uncertainty in investment decision-making.
- Money managers that employ active methods in an effort to outperform the market are subject to alpha risk because alpha is a gauge for excess return.
- The rate at which the delta of an option position shifts in response to a one-point change in the price of the underlying asset is known as the gamma of a position.
- Gamma hedging is a strategy that is used in conjunction with delta hedging to protect the trader from changes to a security or maybe the entire portfolio that are more significant than anticipated..
- Hedging and speculating are strategic behaviors that are related to investing, and the terms "speculators" and "hedgers" are used to define a certain kind of trader or investor.

6.10 UNIT END QUESTIONS

A. Descriptive Questions:

Short Answers:

1. Differentiate between Gamma Hedging vs. Delta Hedging: .
2. Explain in detail Hedging.
3. What is Speculation?

4. Discuss the advantages and disadvantages of Risk Management Process.
5. Explain risk management process.

B. Fill in the blanks:

1.is a metric for excess return, and money managers that use active strategies in an effort to outperform the market are exposed to alpha risk.
2. Gamma hedging is a trading strategy that aims to keep the delta in an options position.....
3. The....., the first formula to be accepted as a standard for pricing options.
4. are investors who make financial decisions based on informed assumptions about the future direction of a market.
5. Managing results in time loss as compensation for projects.

Answers:

1- Alpha, 2- constant, 3- Black-Scholes Model, 4-Speculators, 5- risks

6.11 REFERENCES

- Derivatives Market NCFM Module. National Stock Exchange India Limited Publications : Bombay : 2007.
- Gupta S. L (2007). Financial Derivatives Prentice Hall. New Delhi.
- Indian Stock Market Review. National Stock Exchange Publications.
- Jaynath Rama Varma (2008). Derivatives and Risk Management. Tata Mc Graw Hill Publications : New Delhi



OPTIONS

Unit Structure

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Options Volatility
- 7.3 Historical and implied volatility
- 7.4 Volatility smile
- 7.5 Volatility term structure
- 7.6 Advance models of volatility estimation
- 7.7 Value at risk (VaR) and Historical simulation
- 7.8 Model building approach
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- 7.12 References

7.0 OBJECTIVES

After studying this unit, you will be able:

- To understand options volatility
- To discuss historical and implied volatility
- To explain Volatility smile
- To describe Volatility term structure
- To understand advance models of volatility estimation
- To analyse Value at risk (VaR)
- To discuss Historical simulation
- To explain Model building approach
- To understand Stress testing and back testing

7.1 INTRODUCTION

Options are aptly named financial derivatives that give their holders the option to purchase or sell an underlying asset at a predetermined strike price, on or before a predetermined expiration date. Options are most often

written on stocks but can be linked to other types of assets as well. To induce investors to issue an option and thereby obligate themselves to make a disadvantageous trade, option holders must pay a premium to the option issuer based on the option type, strike price, expiration date, interest rates, and volatility of the underlying asset.

Options can be used to hedge or speculate in various ways. An investor might buy a call option on a stock in the hopes that the stock price will rise above the strike price, allowing her to buy the stock at the strike price (e.g., \$90) and immediately resell it at the higher market price (e.g., \$100). Or an investor might buy a put option to minimize his losses. If the stock fell from \$100 to \$50 per share, for example, a put option at \$75 would be profitable or “in the money” because the investor could buy the stock in the market at \$50 and then exercise his option to sell the stock to the option issuer at \$75 for a gross profit of \$25 per share.

7.2 OPTIONS VOLATILITY

Financial derivatives known as options give the holder (the buyer) the right to buy (in the case of a call) or sell (in the case of a put) the underlying asset at a certain price on or before a given date. Call option holders look to profit from an increase in the value of the underlying asset, whereas put option holders profit from a decrease in value. Options are flexible and have a wide range of applications. While some traders only employ options for speculation, other investors, such those in hedge funds, frequently use options to reduce the risks associated with asset ownership.

Options Pricing:

The term "premium" is frequently used to describe an option's cost. The buyer pays the premium to the option seller (also known as the writer) in exchange for receiving the above-described right to buy (or sell). The buyer has two options: they can either use the option or let it expire worthless. The seller keeps the premium regardless of whether the option is exercised because the buyer still pays it. As a result, the cost of the option is determined by the likelihood that the buyer will be able to exercise it profitably.

The intrinsic value of the option and its temporal value make up the two components of an option's premium (extrinsic value).

The discrepancy between the price of the underlying asset and the strike price is known as the intrinsic value. The latter is the portion of the option premium that is in-the-money. A call option's intrinsic value is determined by subtracting the strike price from the option's underlying value. On the other hand, the intrinsic value of a put option is equal to the strike price less the underlying price. However, the time value is the portion of the premium that is related to how much time is left until the option contract expires. Therefore, the time value equals the premium less its inherent worth.

7.3 HISTORICAL AND IMPLIED VOLATILITY

Historical Volatility

Historical volatility, also known as statistical volatility, measures price changes across predefined time periods to estimate the fluctuations of underlying securities. Compared to implied volatility, it is the less used statistic because it is backward-looking.

The price of an investment will fluctuate more than usual when historical volatility increases. There is a current expectation that something will change or already has. On the other hand, if historical volatility is declining, it indicates that all uncertainty has been removed and that things have returned to normal.

Although this estimate may be based on intraday fluctuations, it frequently gauges moves as the difference between two closing prices. Historical volatility can be calculated in steps of 10 to 180 trading days, depending on the anticipated length of the options trade.

Investors can learn more about relative values for the targeted time frames of their options trading by analysing the percentage changes over larger time periods. A stock is trading with higher-than-normal volatility, for instance, if the historical volatility average over 180 days is 25% and the reading for the 10 days prior is 45%. Because implied volatility takes a forward-looking reading on option premiums at the time of the deal, and historical volatility examines prior metrics, options traders frequently combine the data.

Implied Volatility:

A key indicator for options traders is implied volatility (IV), also known as predicted volatility. As the name implies, it enables them to predict how volatile the market will be in the future. Additionally, this idea offers traders a mechanism to compute likelihood. It's vital to keep in mind that since it shouldn't be regarded as science, it cannot predict how the market will behave in the future.

Implied volatility, which derives from an option's price and represents its future volatility, differs from historical volatility. Trading performance cannot be used as a predictor of future performance because it is implied. Instead, they must make an assessment of the option's market potential.

Implied volatility measures the anticipated variations of an underlying stock or index over a given time period by identifying substantial imbalances in supply and demand. The price of options premiums is strongly associated with these expectations, increasing in times of apparent excess supply or demand and decreasing in times of equilibrium.

Numerous factors, ranging from market-wide events to news specifically pertaining to one particular company, can have an impact on the degree of supply and demand, which generates implied volatility measurements.

For instance, implied volatility and option premiums could significantly rise in the few days before a quarterly earnings report if multiple Wall Street experts predict three days beforehand that a business will soundly outperform predicted earnings. In the absence of a future event to boost demand and volatility, implied volatility is likely to decrease once the earnings are released.

7.4 VOLATILITY SMILE

Plotting the strike price and implied volatility of a collection of options with the same underlying asset and expiration date yields a similar graph shape known as a volatility smile. The volatility smile got its name because it resembles a mouth-smile. When an option's underlying asset is further out-of-the-money (OTM) or in-the-money (ITM) than it is at the money, implied volatility increases (ATM). Not all options fall under the scope of the volatility smile.

What Does a Volatility Smile Tell You?

Volatility smiles are caused by changes in implied volatility as the underlying asset swings more in one direction or the other. The implied volatility of an option increases with the percentage of ITM or OTM. With ATM options, implied volatility is typically at its lowest.

The Black-Scholes model, one of the key formulas used to price options and other derivatives, does not forecast the volatility grin. When plotted against different strike prices, the implied volatility curve should be flat, according to the Black-Scholes model. The model predicts that regardless of the strike price, the implied volatility would be the same for all options having the same underlying asset and expiring on the same date. However, this is not how things actually work.

Moreover, the inconsistent The existence of grin demonstrates that ITM and OTM choices are frequently more popular than ATM options. Prices are driven by demand, which has an impact on implied volatility. This may be partially caused by the aforementioned factor. Extreme occurrences can lead to large price changes in options. Implied volatility takes into account the potential for significant shifts.

Limitations of Using the Volatility Smile:

Finding out whether the option being traded genuinely corresponds with a volatility smile is crucial first. One model that an option may align with is the volatility smile, however implied volatility may align more with a reverse or forward skew/smirk.

Additionally, the volatility smile (if applicable) may not have a clear U-shape due to other market considerations like supply and demand (or smirk). It might be choppy, with certain options exhibiting more or less implied volatility than would be predicted by the model, but it might have a fundamental U-shape.

The volatility smile shows traders where to seek to get more or less implied volatility, but there are a lot of other things to think about when choosing an options strategy.

7.5 VOLATILITY TERM STRUCTURE

The volatility term structure, which is a component of the volatility surface, illustrates how, even for the same strike price, options on the same stock would exhibit various implied volatilities for various expiry months. The volatility term structure can have an upward or downward slope depending on market conditions and expectations, similar to the term structure of bonds (where interest rates vary based on maturity). The term structure's slope tells traders whether they anticipate the underlying stock to become more volatile over time or less volatile over time.

Understanding Term Structure Of Interest Rates :

According to general principles, yields rise with maturity, creating an upward-sloping, or normal, yield curve. The term structure of interest rates for typical U.S. government-issued securities is depicted by the yield curve. This is significant because it provides insight into how the debt market perceives risk. One common yield curve contrasts U.S. Treasury paper with maturities of three months, two years, five years, ten years, and thirty years. The Treasury's interest rate website typically has yield curve rates by 6:00 p.m. Eastern Standard Time on trade days.

The term of the structure of interest rates has three primary shapes:

1. Long-term rates have an upward slope and are higher than short-term yields. This yield curve's slope is thought to be "normal" and shows that the economy is growing.
2. In a downward sloping curve, short-term yields surpass long-term yields. A yield curve that has "inverted" suggests that the economy is currently undergoing or is soon to experience a recession.
3. Flat—yields over the short- and long-terms do not differ significantly. This suggests that the market is unsure about the direction the economy will head in..

7.6 ADVANCE MODELS OF VOLATILITY ESTIMATION

Calculating the standard deviation of a security's prices over time is the easiest method for identifying a security's volatility. The following steps can be used to accomplish this:

1. Compile the security's historical pricing.
2. Determine the average (mean) price of the security's previous prices.
3. Calculate the difference between the average price and each price in the set.

4. Square the discrepancies from step 3.
5. Add up the differences by squares.
6. Subtract the squared variations from the total number of prices in the collection (find variance).
7. Square-root the result of the preceding step's calculation.

7.7 VALUE AT RISK (VaR) AND HISTORICAL SIMULATION

Value at risk, or VaR, is a statistic that gauges the possible magnitude of financial losses that could happen inside a business, portfolio, or position over the course of a specific time frame. Investment and commercial banks most frequently utilise this figure to determine the sort, size, and possibility of future losses in their separate institutional portfolios.

Risk managers utilise Value at Risk (VaR) as a technique to assess and cap the degree of risk exposure. Value at risk calculations can be used to assess the overall risk exposure of a full company as well as individual holdings and entire portfolios.

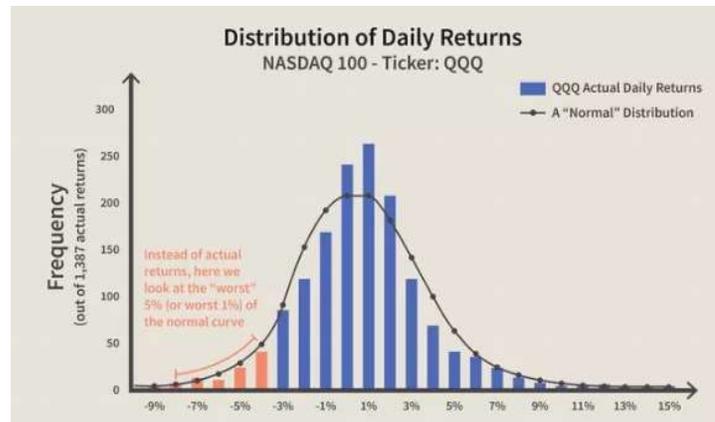
KEY TAKEAWAYS:

Value at risk, commonly abbreviated as VaR, is a technique for estimating the risk of potential losses that a business or investment might experience. Numerous methods, including the historical, variance-covariance, and Monte Carlo procedures, can be used to determine this metric. Investment banks frequently use VaR modelling to assess enterprise risk. The reason for this is that distinct trading desks may unintentionally expose the company to assets that are closely related.

Understanding Value at Risk (VaR):

The value at risk (VaR) modelling procedure determines the entity being evaluated's potential for loss as well as the likelihood that the indicated loss will occur. The three factors that are considered in order to compute VaR are the timeframe, the probability that the potential loss will occur, and the potential loss amount.

For instance, a financial institution might determine that an asset has a VaR of 3 percent for one month, meaning there is a 3 percent chance that the asset's value will fall by 2 percent during that month. We discover that the probability of experiencing a loss of two percent occurs once every month after converting the possibility of occurrence of three percent to a daily ratio.



It is possible to determine the aggregated risks posed by the positions held by the various trading desks and divisions that make up the organisation by using a VaR evaluation that is company-wide. With the aid of the data provided by VaR modelling, financial institutions are able to assess whether they have sufficient capital reserves in place to absorb losses or whether they need to reduce the amount of concentrated assets they have due to higher-than-acceptable risks.

VaR Methodologies:

The three main methods for calculating VaR are as follows. The historical technique, or the first strategy, compiles a person's prior return history in the order of worst losses to largest profits. This strategy is predicated on the idea that a person's past return experiences will influence future outcomes.

The variance-covariance approach is the name given to the second methodology. Instead of assuming that the past will offer insight into the future, this approach assumes that profits and losses follow a normal distribution. In this way, it is possible to conceptualise the possibility of loss in terms of the standard deviation of events in relation to the mean.

The third and last method for determining VaR involves the use of a Monte Carlo simulation. This strategy uses computer models to simulate expected returns over a range of potentially dozens to millions of iterations. Then, it calculates the effect by factoring in the probability that a loss will occur, say 5% of the time.

The Concept That Drives VAR:

Volatility is often considered to be the most accurate and reliable indicator of risk. However, the primary issue with volatility is that it does not care about the direction in which an investment moves. For example, a stock may be considered volatile if it suddenly rises upward in price. Naturally, investors aren't bothered by increases in their portfolios.

The VAR model is based on the self-evident notion that, in the context of financial investments, "risk" refers to the likelihood of suffering a financial loss. By assuming investors are worried about the likelihood of

incurring a very large loss, VAR offers a solution to the questions "What is my worst-case scenario?" and "How much might I lose in a truly terrible month?"

Let's now get to the meat of the matter. The loss amount, time period, and confidence level (or loss percentage) are the three components that make up a VAR statistic. As we walk through many examples of various ways that the question to which VAR reacts could be formulated, keep in mind these three elements:

- What should I expect to happen financially in the worst-case scenario with a 95 or 99 percent degree of confidence for the upcoming month?
- How much weight loss can I anticipate in the upcoming year with a 95 or 99 percent confidence level? What is the most percentage I may reasonably expect to lose?

You can see how the "VAR question" is made up of three elements: an estimate of investment loss (expressed in either dollars or percentage terms), a time period, and a relatively high level of confidence (often either 95 percent or 99 percent).

Calculating VAR Using Various Methods:

To evaluate the risk of a single index that moves like a stock, however, we shall use VAR for the purposes of this introduction. The Nasdaq 100 Index, which is traded through the INVESCO QQQ Trust, is the index in question. VAR is used by institutional investors to assess the overall risk of their portfolios. The most prominent non-financial stocks that are traded on the Nasdaq exchange are tracked by the exceedingly well-known QQQ index.

Calculating variance and covariance (VAR) may be done in one of three ways: the historical technique, the variance-covariance method, or by a Monte Carlo simulation:

1. A Method Based on History:

The historical technique entails nothing more than rearranging the actual historical results and placing them in descending order from the poorest to the highest. From a risk management point of view, it is thus presumed that previous events will be repeated.

The Nasdaq 100 Exchange Traded Fund (ETF), which began trading in March of 1999 and goes by the ticker code QQQ and is sometimes referred to as the "cubes" in certain circles, is a good historical example.

If we do calculations for each daily return, we would end up with a comprehensive data collection that has more than 1,400 points. Put them in a histogram that compares the different "buckets" of the frequency of return, shall we?

2. The Approach Based on Variance and Covariance:

This strategy assumes that stock return distributions are normally distributed. To put it another way, we only need to estimate two components in order to represent a normal distribution curve: the expected (or average) return and the standard deviation. We'll be able to plot the curve thanks to these two variables. The same real return data displayed above is used to illustrate the normal curve:

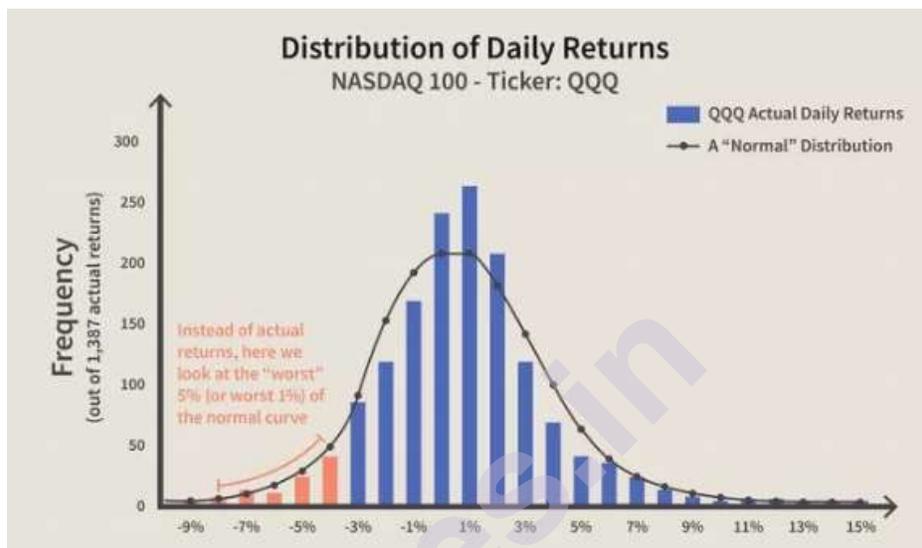


Fig:3.1

With the exception of using the well-known curve rather than the actual data, the idea underlying variance-covariance is the same as the idea underlying the historical approach. The advantage of adopting a normal curve is that it allows us to instantly identify where the worst 5% and worst 1% of the data are located on the curve. They depend on both the standard deviation and the desired level of confidence in the results.

Confidence	# of Standard Deviations (σ)
95% (high)	- 1.65 x σ
99% (really high)	- 2.33 x σ

Fig:3.2

The blue curve that can be seen above is based on the actual daily standard deviation of the QQQ, which is 2.64 percent. For the purpose of simplicity, we will assume that the average return is zero because it just so happened that the average daily return was rather close to zero. The following conclusions have been reached after incorporating the real standard deviation into the computations previously mentioned:

Confidence	# of σ	Calculation	Equals
95% (high)	- 1.65 x σ	- 1.65 x (2.64%) =	-4.36%
99% (really high)	- 2.33 x σ	- 2.33 x (2.64%) =	-6.15%

Fig:3.3

3. Monte Carlo Simulation:

The third method involves developing a model to forecast future stock price returns and then testing that model using a variety of fictitious scenarios. Any method that generates trials in a random order is a Monte Carlo simulation, however the word "Monte Carlo simulation" by itself says nothing about the methodology being employed.

A Monte Carlo simulation can be viewed as a "black box" generator of random and probabilistic outputs by the vast majority of users. We will not go into further details, but we did a Monte Carlo simulation on the QQQ using the historical trading pattern. We conducted a total of 100 different experiments in our simulation. We would receive a different result if we repeated the experiment, but it's likely that the differences would be rather minor.

Briefly stated, we ran 100 fictitious simulations of monthly returns for the QQQ. Three of the findings fell between a range of 20 and 25 percent, while two of the results fell between -15 and -20 percent. This suggests that the worst five results, or the worst 5% of results, were less than a negative 15%. As a result, the Monte Carlo simulation leads to the following VAR-type conclusion: we do not anticipate losing more than 15 percent during any given month with a level of certainty of 95 percent.

How do you determine the value that is at risk?

The three techniques that can be used to calculate the variance-covariance ratio (VAR) are the historical approach, the variance-covariance methodology, and the Monte Carlo method. The historical technique, which operates under the assumption that the results of subsequent observations will be comparable, is used to assess the data from earlier observations. Based on a measured standard deviation, the variance-covariance technique gives predictions about risk. It is assumed that potential losses have a normal distribution in order for this strategy to work. The simulation method creates a model that may be applied to subsequent simulations of the process' results.

How Do You Calculate Value at Risk in Excel?

You may find the VAR of a stock or index using the statistics tools in Excel or any other spread sheet programme. A calculator may also be used to perform this computation. Getting a dataset with historical pricing is the first thing that needs to be done. Use the statistical tools given by the spreadsheet to determine the mean and standard deviation of the daily percentage returns. By taking the inverse of the normal distribution curve

and applying it to the data, one can determine the Value at Risk. The function, which goes by the name NORM.INV(), can be found in Excel. Confidence Level, Mean, and Standard Deviation are acceptable reasons.

What are some of Value at Risk's Downsides as an Investment Strategy?

VAR can be misleading even if it is useful for estimating the risks that an investment may encounter. The fact that different methodologies give conflicting findings is one critique. For instance, utilising the historical approach may result in a gloomy forecast, while the outcomes of Monte Carlo simulations are frequently more optimistic. Due to the fact that many of the assets in a large portfolio will be tied to one another, it may be difficult to compute the VAR for each individual asset in a large portfolio. In conclusion, the data and assumptions utilised in any VAR calculation's formulation are wholly responsible for determining how accurate the calculation is.

The Bottom Line

The Bottom Line Value at Risk (VAR) is a calculation that determines the greatest loss that may be predicted (or the worst case scenario) on an investment, given a certain degree of confidence and taking into account a particular amount of time. We examined three methods that are frequently used to compute VAR. However, keep in mind that two of our methods computed a daily VAR, and the third technique computed a monthly VAR.

7.8 MODEL BUILDING APPROACH

The model-building strategy, also known as the variance-covariance approach, is an alternative to the historical simulation approach for computing risk metrics like VaR and expected shortfall (ES). This entails making an assumption about a model for the joint distribution of changes in market variables and estimating the model's parameters using historical data.

A portfolio with long and short positions in stocks, bonds, commodities, and other items is well suited for the model-building technique. It is founded on Harry Markowitz's ground breaking portfolio theory research. The mean and standard deviation of the returns on the underlying products and the correlations between those returns can be used to compute the mean and standard deviation of the value of a portfolio. The probability distribution for the change in the value of the portfolio over the course of a day is also normal if, and this is a major if, daily returns on the assets are assumed to be multivariate normal. Calculating the value at risk is made very simple by this.

7.9 STRESS TESTING AND BACK TESTING

The resilience of institutions and investment portfolios against potential future financial scenarios is tested using the computer simulation approach known as "stress testing." Such testing is frequently employed by the financial sector to assess internal procedures and controls, as well

as investment risk and asset sufficiency. Regulators have recently mandated that financial institutions conduct stress tests to make sure their capital reserves and other assets are sufficient.

Stress testing is a typical tool used by businesses that manage assets and investments to assess portfolio risk and implement any hedging techniques necessary to protect against potential losses. Their portfolio managers specifically use in-house, proprietary stress-testing methods to assess how well the assets they manage might withstand specific market developments and outside events.

Additionally, firms that want to make sure they have the right internal controls and processes in place frequently conduct asset and liability matching stress tests. The alignment of cash flow, payout levels, and other metrics is regularly checked in retirement and insurance portfolios as well.

Types of Stress Testing

Run simulations as part of stress testing to find unknown vulnerabilities. The literature on corporate governance and company strategy suggests various methods for conducting these exercises. Stylized scenarios, hypotheticals, and historical scenarios are some of the most well-liked types.

Historical Stress Testing

In a historical scenario, a simulation based on a past crisis is run for the firm, asset class, portfolio, or individual investment. The stock market crash of October 1987, the Asian crisis of 1997, and the tech bubble that burst in 1999–2000 are a few examples of historical crises.

Hypothetical Stress Testing

A hypothetical stress test is typically more focused, frequently concentrating on how a single organisation may handle a specific catastrophe. A company in California might do a stress test against a fictitious earthquake, or an oil company would do so against the start of a Middle Eastern war.

Insofar as only one or a few test variables are changed at once, stylized situations are a little more scientific. The stress test, for instance, might see the Dow Jones index lose 10% of its value in a single week.

Simulated Stress Testing

Monte Carlo simulation is one of the most well-known stress test methodologies. With regard to particular variables, this kind of stress testing can be used to estimate the likelihood of various outcomes. The Monte Carlo simulation, for instance, frequently takes a variety of economic variables into account.

For different kinds of stress tests, businesses can also resort to professionally run risk management and software providers. One example of an external stress-testing programme that can be used to assess risk in asset portfolios is Moody's Analytics.

Backtesting

The standard technique for determining how well a strategy or model would have performed ex-post is backtesting. Backtesting examines the performance of a trading strategy using past data to determine its viability. If backtesting is successful, traders and analysts might feel confident using it in the future.

Before investing any real money, a trader can backtest a trading strategy by simulating it with past data to create outcomes and assess risk and profitability.

Traders can be certain that a strategy is fundamentally good and is likely to produce profits when put into practise by looking at a well-conducted backtest that produces favourable outcomes. A well-conducted backtest that produces unsatisfactory outcomes, on the other hand, will lead traders to adjust or reject the strategy.

A trade notion can be backtested as long as it can be quantified. To transform the concept into a tested form, some traders and investors might seek the assistance of a trained coder. Typically, a programmer would implement the concept in the trading platform's proprietary language.

User-defined input variables can be added by the programmer, giving the trader the ability to "tweak" the system. The simple moving average (SMA) crossover mechanism is an illustration of this. The lengths of the two moving averages that make up the strategy could be inputted by the trader or altered. The trader might then do a backtest to identify the moving average lengths that would have had the best results on the historical data.

7.10 SUMMARY

- Financial derivatives known as options give the holder (the buyer) the right to buy (in the case of a call) or sell (in the case of a put) the underlying asset at a certain price on or before a given date.
- The intrinsic value of the option and its temporal value make up the two components of an option's premium (extrinsic value).
- Implied volatility, which derives from an option's price and represents its future volatility, differs from historical volatility.
- The volatility smile shows traders where to seek to get more or less implied volatility, but there are a lot of other things to think about when choosing an options strategy.
- The value at risk (VaR) modelling process identifies the potential for loss in the entity being evaluated as well as the chance that the stated loss will take place.

7.11 UNIT END QUESTIONS

Options

A. Descriptive Questions:

Short Answers:

1. What are Options?
2. Explain the difference between Historical and implied volatility.
3. Write note on Volatility smile.
4. Explain the three primary shapes of interest rates.
5. What is VaR?
6. Explain in detail Stress testing and back testing.

B. Fill in the blanks:

1. **1** The term "....." is frequently used to describe an option's cost.
2. Historical volatility, is also known as.....
3. Implied volatility (IV), is also known as.....
4. is a tool that is used by risk managers to quantify and limit the amount of risk exposure.
5. is one of the most well-known stress test methodologies.

Answers:

1- premium, 2- statistical volatility, 3- predicted volatility, 4-Value at Risk (VaR), 5- Monte Carlo simulation.

7.12 REFERENCES

- Derivatives Market NCFM Module. National Stock Exchange India Limited Publications : Bombay : 2007.
- Gupta S. L (2007). Financial Derivatives Prentice Hall. New Delhi.
- Indian Stock Market Review. National Stock Exchange Publications.
- Jaynath Rama Varma (2008). Derivatives and Risk Management. Tata Mc Graw Hill Publications : New Delhi.



TRADING, CLEARING AND SETTLEMENT IN DERIVATIVES MARKETS

Unit Structure

- 8.0 Objectives
- 8.1 Introduction
- 8.2 Concept of Trading
- 8.3 Clearing and Settlement in Derivatives Markets
- 8.4 SEBI guidelines
- 8.5 Trading mechanism
- 8.6 Learning mechanism- role of NSCCL
- 8.7 Settlement mechanism
- 8.8 Types of settlement
- 8.9 Accounting and taxation aspect of derivatives trade
- 8.10 Summary
- 8.11 Unit End Questions
- 8.12 References

8.0 OBJECTIVES

After studying this unit, you will be able to:

- To illustrate the concept of Trading
- Discuss Clearing and Settlement in Derivatives Markets
- To explain SEBI guidelines
- To understand Trading mechanism
- To describe Learning mechanism- role of NSCCL
- To analyse Settlement mechanism
- To discuss types of settlement
- To analyse accounting and taxation aspect of derivatives trade.

8.1 INTRODUCTION

Futures trading is a vital industry for a nation's economy to expand. The first kind of derivatives trading is a specific field that requires experts with in-depth knowledge of the subject. As a speculator, arbitrageur, trader, investor, or hedger, you must have the requisite understanding and awareness of how the futures markets function in order to operate the market effectively. These are essential for establishing how derivatives goods should be valued and priced so that market participants can select them depending on their objectives.

Futures are only important to market participants when their prices accurately reflect information about how much the underlying assets are worth. As a result, it's critical to understand how futures markets function and how futures contract prices relate to spot pricing. In this part, we'll examine the factors that commonly affect futures pricing. Commodities, foreign exchange, and securities are just a few examples of the different assets whose futures values are impacted by several factors that are not common to all of these assets. The futures values of foreign currencies, for instance, can be determined by a variety of factors, just like the prices of cereals and vegetables might be.

8.2 CONCEPT OF TRADING

The NEAT-F&O trading system, which is used by the NSE to trade futures and options, provides screen-based trading for stock futures and options as well as fully automated national trading for Nifty futures and options. It enables an order-driven market and provides complete transparency in trading activity. The cash market sector equities trading is comparable.

Entities in the Trading System There are four parties/entities in the trading system. They are trading members, clearing members, professional clearing members and participants.

- **Trading members:** Trading participants are members of the NSE. They can choose to trade for themselves or for their customers, which includes other traders. An ID is given to each trading participant by the exchange. For each trading partner, there could be a number of users. The number of users allowed is frequently communicated to members who can trade. Each user of a trading member who registers with the exchange receives a special user ID. All orders and traders from different users can be identified by their unique trading member IDs. This ID is shared by all users of a certain trade member.
- **Clearing members:** Clearing participants are NSCCL participants. Through the trading system, they perform risk management tasks and confirm or enquire about trades.
- **Professional clearing members:** A professional clearing member is a clearing member who is not a trading member. Typically, financial

institutions like banks and custodians join professional clearing bodies to clear and settle deals for their trading members.

- **Participants:** Financial institutions' and other trading members' clients are referred to as participants. These clients may transact with a number of trading members but only with one clearing member.

Types of Traders

In the futures markets, traders are essential because they provide liquidity. Futures were initially developed to assist hedgers in controlling their exposure to price risk, even though traders, also referred to as speculators, are essential to the maintenance of a market of buyers and sellers. Speculators offer the majority of market liquidity, allowing the hedger to enter and exit the market more quickly.

In other words, the two basic categories of traders are speculators and hedgers. Hedgers use the futures market to manage price risk. Speculators, on the other hand, are people who use the futures market with the goal of profiting from it. As a result, in exchange for the possibility to make money, the speculator takes market risk. There are different ways to categorise futures traders. Professional traders might have full-time or part-time occupations, and they can trade from a desk or on the trading floor. Each of these market participants makes a substantial contribution to the markets' efficiency as venues for conducting business.

Public Traders

The vast majority of speculators are private individuals who trade off the floor with their own money. This broad range of companies is typically referred to as "retail" firms. As activity on the trading floor shifts more and more to the computer screen, the retail consumer is becoming a more important factor in futures trading. Furthermore, computer-based trading has made "levelling the playing field" between different sorts of traders a reality.

“Local” Traders

The most prominent and colourful speculator is probably the professional floor trader, sometimes known as a local, who transacts on the exchange floor for his own account. Many of the locals, who come from a variety of backgrounds, began their careers as runners, clerks, or assistants for other traders and brokers. Locals frequently exhibit greater interest in the trading pit's market activity than they do in the underlying markets' fundamentals. A trader known as a "electronic local" operates similarly to a floor local due to the widespread use of electronic trading.

Proprietary Traders

Another crucial type of trader is the proprietary trader, who works off the trading floor for a respected trading organisation. These "upstairs" traders are employed by large banks, trading corporations, and investment organisations that are frequently situated in important financial hubs. This

group engages in commerce to achieve a range of specific objectives. Some traders engage in speculative transactions, profiting when the market changes in their favour. These proprietary traders are paid according to the revenue they generate. Various proprietary traders manage risk by hedging or spreading it across various markets, including both the cash and futures markets, to shield their organisation from the threat of price volatility or the chance of profiting from differences and transient inefficiencies in market-to-market pricing.

Market Makers

Market makers continuously declare a bid (an expression to buy) and an offer (an expression to sell), so supplying the market with liquidity. In electronic markets, market makers are becoming increasingly important since they ensure that all types of traders can buy and sell whenever they want. Market makers frequently profit from the "spread," or the little difference between the bid and offer (or ask) prices.

8.3 CLEARING AND SETTLEMENT IN DERIVATIVES MARKETS

A Clearing Member (CM) of NSCCL, who clears and settles such trades through businesses, must clear and settle every transaction made by a Trading Member (TM) on the NSE. The following organisations work with NSCCL to conduct clearing and settlement activities in the F&O segment:

- ClearingMembers
- ClearingBanks

Clearing Members

Self-clearing participants are those F&O segment participants that only clear and settle agreements for their own account or the account of their clients. In addition to clearing and settling the deals of other trading members (TMs), certain people are known as trading members-cum-clearing members. Professional clearing members (PCM), a specific membership category, are also responsible for clearing and settling transactions conducted by TMs. The members clearing their own trades and the transactions of others are required to submit additional security deposits, as must the PCMs, for every TM whose trades they agree to clear and settle. The CM mostly performs the following tasks:

1. **Clearing:** Calculating all of his TMs' responsibilities, or deciding which positions to settle.
2. **Settlement:** The act of really settling. Index and Stock futures and options contracts now only allow for funds settlement.

3. Risk Management: Risk management, which entails establishing position limits based on upfront deposits margins for each TM and continuously tracking positions.

Types of Clearing Members : The types of clearing members are:

- **Trading Member Clearing Member (TM-CM):** a TM who also participates in clearing. Any deal, including those of other TMs, their clients, and their own trades, can be cleared and settled by these CMs.
- **Professional Clearing Member (PCM):** CM who cannot be TM. A PCM may often be a bank or a custodian who would clear and settle for TMs.
- **Self Clearing Member (SCM):** A TM who is also a clearing member. These CMs are only permitted to clear and settle their own proprietary trades and those of their clients; they are not permitted to clear and settle deals of other TMs.

Clearing Banks

Funds are settled by clearing banks. Each clearing member is required to open a unique bank account with one of the organisations listed below: The NSCCL designated clearing bank for the F&O market is one of the following: ICICI Bank, IDBI Bank, IndusInd Bank, Kotak Mahindra Bank, Standard Chartered Bank, State Bank of India, or Union Bank of India Ltd.

Every clearing member is required to maintain and operate clearing accounts at any of the permitted clearing bank branches with any of the empanelled clearing banks. The only purposes for which the clearing accounts may be put to use are clearing and settlement.

8.4 SEBI GUIDELINES

The regulatory framework for derivative trading in India was established by the Dr. L.C. Gupta Committee, which was established by SEBI. For Derivative Exchanges/ Segments and their Clearing Corporations/ Houses, SEBI has also drafted a suggested bye-law that lays out the rules for the trading and settlement of derivative contracts. According to the suggested byelaws, the Rules, Bye-laws & Regulations of the Derivative Segment of the Exchanges and their Clearing Corporation/ House must be written. Additionally, SEBI has established the requirements for Derivative Exchange/ Segment and its Clearing Corporation/ House. Derivative Exchange/ Segment & Clearing Corporation/ House has been required to provide a transparent trading environment, safety, and integrity, as well as facilities for the resolution of investor complaints, which is why the eligibility requirements have been set forth. Some of the important eligibility conditions are -

1. The use of an online screen-based trading system for derivative trading.
2. To prevent market manipulation, the Derivatives Exchange/Segment must have online surveillance capacity to track positions, prices, and volumes in real time.
3. The Derivatives Exchange/Segment should have plans in place to provide for the real-time transmission of information regarding deals, volumes, and quotes over at least two easily accessible information vending networks for investors across the nation.
4. The Arbitration and Investor Dispute Resolution Mechanism for the Derivatives Exchange/Segment should be operational from all four areas / regions of the nation.
5. The Derivatives Exchange/Segment should have a reliable system in place to keep track of investor complaints and stop trade irregularities.
6. The Exchange's Derivative Segment would have its own Investor Protection Fund.
7. The Clearing Corporation/House shall perform full novation, i.e., the Clearing Corporation/House shall intervene between both legs of each trade, becoming the legal counterparty to both, or alternatively, the Clearing Corporation/House should give an absolute guarantee for the settlement of all trades.
8. For those Members who participate in both the derivatives market and the market for underlying securities, the Clearing Corporation/House shall have the ability to monitor the overall position of Members across both markets.
9. The initial margin amount for Index Futures Contracts shall be based on the position's risk of loss. The appropriate level of initial margins shall be determined using the value-at-risk principle. The starting margins have to be sufficient to cover the potential one-day loss on the position on 99% of the days.
10. To facilitate the quick transfer of margin payments, the clearing corporation or house shall provide up EFT capabilities.
11. If a Member fails to pay its obligations, the Clearing Corporation/House must cancel out any open accounts or transfer client positions and assets to another Member in good standing.
12. The clearing corporation or house must be able to separate the initial margin deposits made by clearing members for trades executed on their own accounts from those executed on behalf of their clients. The Clearing Corporation/House must keep the clients' margin funds in trust and utilise them exclusively for those purposes; they must not permit their use for any other purposes.

13. For trades completed on the derivative exchange or segment, the clearing corporation or house must establish a separate Trade Guarantee Fund.

At this time, SEBI has allowed derivative trading on the BSE's derivative segment and the NSE's F&O segment.

8.5 TRADING MECHANISM

The trading mechanism mainly consists of settling open positions and clearing members' obligations (self-clearing, trading-cum-clearing, professional clearing). This stake is taken into account for exposure and daily margin calculations. Clearing members (CMs) may calculate their own open positions by aggregating the open positions of all trading members (TMs) and all custodial participants clearing via him in contracts in which they have traded. A TM's open position in the contracts in which he has traded is determined by adding his own open position and the open positions of his clients. When submitting orders on the trading system, TMs must use the 'Pro/Cli' indicator, which is provided in the order entry screen, to differentiate between proprietary (if they are their own trades) and client (if placed on behalf of clients) orders. Proprietary positions are calculated on a net basis (buy - sell) for each contract. The net (buy - sell) positions of all of the clients are added to determine each client's position.

8.6 LEARNING MECHANISM- ROLE OF NSCCL

The NSCCL is in charge of clearing and settling transactions made on the NSE's stock and futures markets. It employs the standard settlement cycle without any modifications or delays. It aggregates transactions made during a trading period, nets positions to ascertain the liabilities of members, and ensures that money and assets are transferred to cover individual obligations.

The NSCCL has designated 13 clearing banks to provide banking services to trading members, and connectivity with both depositories has been established for electronic settlement of securities.

8.7 SETTLEMENT MECHANISM

All contracts for future delivery and exercise of options are settled in cash, i.e., by exchanging actual currency. For index futures or options, the Nifty index cannot be used as the underlying. Therefore, it is necessary to pay for these responsibilities using cash.

But at the moment, both stock options and futures must be settled in cash. A CM's settlement amount with regard to their obligations for MTM, premium, and exercise settlement is netted over all of their TMs and clients.

Settlement of Futures Contracts

The two types of settlements that apply to futures contracts are the MTM settlement, which happens constantly at the end of each trading day, and the final settlement, which happens on the last trading day of the futures contract.

MTM Settlement: All futures contracts for each member are marked-to-market (MTM) at the relevant futures contract's daily settlement price at the conclusion of each day. The profits/losses for daytime contracts that weren't squared up are determined as the difference between:

1. The day's settlement price and the trade price.
2. The settlement prices from the previous day and the present day for contracts that were brought forward.
3. The prices paid for the acquisition and sale of the daytime transactions that were squared.

Futures Settlement Prices: The daily settlement price for a trading day is based on the closing prices of all individual futures contracts. The closing price of a futures contract shall be the weighted average price of the contract for the preceding half-hour on the F&O Segment of the NSE. The final settlement price is determined by the closing price of the relevant underlying index or security on the last trading day of the contract.

Settlement of Options Contracts

For option contracts on securities, there are three main types of settlements: the daily premium settlement, the exercise payment, and the interim exercise settlement.

Settlement of Daily Premiums: The buyer of an option must pay the premium for the choices they have bought. Similar to this, the seller of an option is entitled to the premium for the option he sold. The premium payable amount and the premium receivable amount are netted to come up with the net premium payable or receivable amount for each customer for each option contract.

Exercise Settlement: Even while most option buyers and sellers close out their options holdings through offset closure transactions, an understanding of exercise can help an option buyer assess if exercise could be more profitable than an offset sale of the option. It is always possible for an exercise to be assigned to the option seller. The option seller is required to satisfy his obligation (pay the cash settlement amount in the case of a cash-settled option) once an exercise of an option has been assigned to him, even though he has not yet been informed of the allocation.

Interim exercise settlement;The only options that are settled upon interim exercise are those on securities. An investor may exercise his in-the-money options through his trading member at any time while trading

is open. At the end of trading on the day of exercise, interim exercise settlement is finished for such options. At the client level, short positions in the same series of options contracts—those with the same underlying, same expiration date, and identical strike price—are assigned at random to validly exercised option contracts.

Final exercise settlement: Any open long in-the-money strike price options that remained open at the close of business on the day the option contract expires are eventually settled. These long positions are all randomly and automatically paired with short positions in option contracts from the same series. The Investor shall pay to the Investor to whom the Option Contract has been allocated the Exercise Settlement Value per Unit of the Long In-the-Money Option on the Expiration Date.

Exercise process: There are many time periods within which an option may be exercised, depending on the type of option. Index options traded on the NSE are of the European kind, which means that they will only automatically expire in-the-money on the day of expiration. In contrast to this, options on securities are American-style. In such cases, the exercise is automatic on the expiration date of the option contract and voluntary prior to that date if they are in-the-money. NSCCL would automatically exercise all of the in-the-money options on the contract's expiration day. The option buyer is not obligated to give an exercise notification in such cases.

To ensure that an option is exercised on that day, the buyer must notify his TM to exercise before the cut-off time for accepting exercise instructions for that day. Ordinarily, the system will accept workout requests right up until the close of business. TMs may have various cutoff timeframes for receiving workout instructions from clients for various alternatives. Options that are not exercised before they expire are worthless. Some TMs might take standing orders to exercise an option that is in-the-money at expiration or have special protocols.

An exercise directive that has already been given to NSCCL by a CM cannot often be reversed. After the trading day's trading hours have ended, NSCCL processes exercise notices submitted by buyers at any time. The legitimacy of each exercise notice that NSCCL receives from the NEAT F&O system is examined. Basic validation checks are made to see if the option contract is in-the-money and the exercising client's or trader's open buy position.

Exercise settlement computation: An exercise directive that has already been given to NSCCL by a CM cannot often be reversed. After the trading day's trading hours have ended, NSCCL processes exercise notices submitted by buyers at any time. The legitimacy of each exercise notice that NSCCL receives from the NEAT F&O system is examined. Basic validation checks are made to see if the option contract is in-the-money and the exercising client's or trader's open buy position.

The exercise settlement price is the closing price of the underlying (index or security) on the exercise day (for interim exercise) or the expiry day of the relevant option contract (final exercise).

The exercise settlement value that a buyer is entitled to for call options is the difference between the final settlement price and the strike price for each unit of the underlying that the option contract conveys, whereas for put options, it is the difference between the strike price and the final settlement price. Currently, the settlement of option exercises occurs in the form of cash payments rather than the delivery of securities. For option contracts that are profitable, it occurs.

The exercise settlement value for each unit of the exercised contract is computed as follows:

Call options=Closing price of the security on the day of exercise-Strike price

Put options=Strike price - Closing price of the security on the day of exercise

The final exercise is based on the closing price of the underlying securities on the day of expiration. The exercise would typically be settled by NSCCL on the third day following the workout day. The workout settlement amount may be paid sooner upon the members' request to assigned clients.

Special Facility for Settlement of Institutional Deals: NSCCL provides a special facility to Institutions/ foreign Institutional Investors (FIIs)/ Mutual Funds etc. to execute trades through any TM, which may be cleared and settled by their own CM. Such entities are called custodial participants (CPs). To avail of this facility, a CP is required to register with NSCCL through his CM. A unique CP code is allotted to the CP by NSCCL. All trades executed by a CP through any TM are required to have the CP code in the relevant field on the trading system at the time of order entry. Such trades executed on behalf of a CP are confirmed by their own CM (and not the CM of the TM through whom the order is entered), within the time specified by NSE on the trade day though the on-line confirmation facility.

The trade is regarded as a trade of the TM until it is verified by the CM of the relevant CP, at which point the CM of the TM is in charge of settling the trade. Following confirmation from the CM of the relevant CP, this CM is in charge of clearing and settling deals for such custodial clients. FIIs have been allowed to trade in all exchange-traded derivative contracts as long as they adhere to the position limitations established for them and their sub-accounts, as well as the established reporting and settlement procedures. To be able to trade in the F&O portion of the exchange, a FI/a sub-account of the FII, as the case may be, must receive a special Custodial Participant (CP) code from the NSCCL. Only FII/sub-accounts of FIIs with a certain CP code that has been assigned by NSCCL are allowed to trade on the F&O section. The FII/sub-account of FI makes

sure that every order they put on the Exchange carries the appropriate CP code that NSCCL has assigned.

8.8 TYPES OF SETTLEMENT

1. Cash Settlement

The seller of the financial instrument transfers the Net Cash position rather than the underlying asset in this manner of settlement. For instance, if the buyer of a Sugarcane Futures contract wants the deal to be settled in cash, they will need to pay the difference between the contract's Spot price on the settlement day and the Futures price set beforehand. The buyer does not need to receive the sugarcane bundles physically.

Cash settlement is employed in derivatives because a futures contract is governed by an exchange, assuring smooth contract execution.

2. Physical Settlement/ Delivery

This refers to a derivatives contract that, as opposed to trading out net cash position or contract offsetting, requires delivery of the actual underlying asset on the specified delivery date. Most derivative transactions are traded, not necessarily completed before delivery deadlines. However, physical delivery of the underlying asset can happen with other financial instruments as well as some exchanges (most commonly with commodities).

8.9 ACCOUNTING AND TAXATION ASPECT OF DERIVATIVES TRADE

Since the underlying asset is neither transferred or delivered, futures cannot be taxed as "capital gains". Accordingly, the head of income—either income from business and profession (IB&P) or income from other sources (IFOS)—will be determined based on whether the assessee is a trader or an investor. However, in either scenario, the income will be taxed on a net basis at the assessee's appropriate tax rates. For the option writer, the option premium is a source of revenue, while for the option buyer, it is a tax-deductible expense. Gains from executing an option in the event of a trader are taxable, similar to gains from trading futures. The gain from this will be considered a capital gain rather than an IFOS because there has been a right extinguishment in the investor's case, and the premium will be accepted as the cost of acquisition. On the final day of the fiscal year, when there are still open derivatives contracts in the hands of market players, this is known as a "open interest" position. There may have been unrealized MTM gains or losses as of March 31. If the assessee will benefit from the losses in this circumstance or be subject to tax on the gains. Derivatives contracts must be marked-to-market (MTM) in accordance with conservative accounting rules.

When Tax audit mandatory for Derivative Transactions (F&O Trading)

- If you have a business revenue and a turnover of more than Rs 1 crore, an audit is necessary. In accordance with Section 44AD, an audit is also necessary where the total income exceeds the minimum exemption threshold but the profits are less than 8% (or 6% if all transactions are digital).

Therefore, in the instance of F&O Trading, the following will apply to the tax audit:

In case of Profit from transactions of F&O Trading:

- In the case of profit from derivative transactions, tax audit will be applicable if the turnover from such trading exceeds Rs. 1 crore.
- Tax audit u/s 44AB row's. 44AD will also be applicable, if the net profit from such transactions is less than 8% (6%, if all trades are digital) of the turnover from such transactions.

In case of Loss from F&O Trading:

- A tax audit will be applicable under Section 44AB of the Revenue and Customs Code in the case of a loss from derivative trading because the profit (in this example, the loss) is less than 8% (or 6% if all trades are digital).

Loss in respect of Speculative Business Income:

- According to Section 73 of the Income Tax Act, a loss incurred in a speculative enterprise may only be offset against other speculative incomes earned during the year. In the event that any such loss is not offset, it may be carried forward and offset only against speculative incomes for a maximum of four additional assessment years.

8.10 SUMMARY

- The National Securities Clearing Corporation Limited (NSCCL), which also serves as the transactions' legal counterparty, oversees the financial settlement of all transactions on the NSE's futures and options (F&O) market.
- The institutional lot sector and the trade-for-trade segment, two exclusive extra market divisions, have been created to support an institutional market where large volume trades occur.
- Clearing and settlement activities in the F&O segment are carried out by NSCCL with the assistance of the Clearing Members and Clearing Banks.
- Some participants in the F&O segment, known as self-clearing participants, clear and settle the deals they execute only for their own

account or the account of their clients. Settlement of funds is done through clearing banks.

- The clearing mechanism essentially involves working out open positions and obligations of clearing (self-clearing/ trading-cum-clearing/ professional clearing) members.
- All futures and options contracts are cash settled, i.e. through exchange of cash. The underlying for index futures/ options of the Nifty index cannot be delivered.
- Options contracts have three types of settlements, daily premium settlement, exercise settlement, interim exercise settlement in the case of option contracts on securities and final settlement.
- In case of index option contracts, all open long positions at in-the-money strike prices are automatically exercised on the expiration day and assigned to short positions in option contracts with the same series on a random basis.

8.11 UNIT END QUESTIONS

A. Descriptive Questions

1. Write about clearing members.
2. Write down the functions of clearing members?
3. Briefly explain about the clearing mechanism?
4. What is marked-to-market settlement?
5. Explain the various types of settlements.

B. Fill in the Blanks

1.undertakes clearing and settlement of all trade executed on the
2. .In the case of options, final exercise settlement is.....
3. .On expiry of a derivatives contract, the settlement price is the.....
4.is a banking institution that is a member of a national check clearing network that has the ability to approve or clear checks for payment, even if those checks are not written on accounts associated with that bank.
5. constituted by SEBI had laid down the regulatory framework for derivative trading in India.

Answers

1-National Securities Clearing Corporation Limited (NSCCL), 2-Automatic, 3- Spot price of underlying asset, 4-Clearing Bank, 5- Dr. L.C Gupta Committee

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8.12 REFERENCES

References book

- Derivatives Market NCFM Module. National Stock Exchange India Limited Publications : Bombay : 2007.
- Gupta S. L (2007). Financial Derivatives Prentice Hall. New Delhi.
- Indian Stock Market Review. National Stock Exchange Publications.
- Jaynath RamaVarma (2008). Derivatives and Risk Management. Tata Mc Graw Hill Publications : New Delhi.



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