Financial Institutions and Markets
Prof. Jitendra Mahakud
Department of Humanities and Social Sciences
Indian Institute of Technology, Kharagpur

Lecture – 51
Derivatives Market – I

So, after the discussion on the stock market, we have another most important market always we observe in the financial system that is the Derivatives Market. If you see the derivatives market is not very new, the derivatives market is existing in the system long back, but maybe it came into the prominence maybe in a last 20 to 30 to 40 years.

But long back the particular system was working and the contracts: the future contracts, options and all these things were existing, and mostly the derivatives market was confined to the commodities. If you talk about the history of the financial system, mostly the derivative trading was applicable or maybe derivative trading were happening for the commodity derivatives or commodity markets.

So, then over the years this has transferred to the financial market also, and nowadays this is a very prominent security and this is basically a prominent instrument, people use it for maximization of the return and as well as hedging the risk. But, mostly the derivatives market is mostly used or the basic objective of the derivatives market is basically hedging. But it is also again people are not nowadays using it only for hedging, they are using it for the speculation and other kind of objectives also.

So, we will be discussing certain issues related to derivatives, first of all we will discuss what are those instruments which are traded in the derivatives market, and why the derivatives how the derivatives are useful. And, next thing is we will be discussing certain concepts which are used in the derivatives market, then we will go into the mechanism of the different markets with respect to the derivatives instruments. Then we will say a little bit about how the normal derivatives are priced in the market, then we can think of the something related to the derivative market in India.

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So, let us see that what is basically derivative. So, the derivative is basically an instrument or security, whose payoff depends upon more primitive or fundamental good. How it is basically works? So, if you see that let there is a company, there is a company who basically makes potato chips ok. So, let ITC so, ITC makes the potato chips. So, ITC wanted to buy let 100 tons of potato to make the potato chip. And another party here there is a potato grower farmer; there is a farmer, who basically cultivates potato, potato cultivator.

So, ITC wanted to buy 100 tons of potato from the farmer and ITC says analyst team finds that let they want potato at the month of December right. So, at the month of December they feel that, the if the price may be the price of the potato will be around in the market per kg will be according to their calculation price of the potato in the market will be 12.

So, they want that if you do the market it will be 12 they feel that it is expensive for me, for them. So, because of that, they want to make a contract with somebody that if they want to buy a 100 tons of potato at a price of 10 rupees. So, 10 rupees if they will pay for kg, it will be profitable for them. So, let the that is why they have sent their requirement to the stock exchange, that we want to buy 100 tons of potato in the month of December and so, and so, date and the price basically what we want 4 kg 10 rupees going to buy this.

That means ITC has taken a buying position or in derivatives language, we call it they have taken a long position. And the farmer also feels that let for some reasons the farmer calculates the price of the potato in the month of December in the market will be less than 10 rupees, in his calculation the market of the price of the potato and the market will be less than 10 rupees, then what the farmer feels that, if I can get 10 rupees then my profitability will be maximized.

Then the farmer sends his requirement to the stock exchange and they want to sell the potato at a price of 10 rupees. Now both the orders or both the requirements are available with the stock exchange, then it is matched. Then the contract has been made between the farmer or the potato cultivator and the ITC and it was decided on so, and so, date, the ITC will deliver ITC will get buy this potato from the farmer and the farmer will deliver this 100 tons of potato to ITC on so, and so, date and so, and so, place.

Then what has happened? Later on that day whenever the potato grower or potato cultivator wants to sell that potato to ITC, let in the market actually the price is become 11 rupees. So, then what has happened? It is a loss for the potato seller. And that loss is basically a notional loss. Why we call it the notional loss? Actually the loss is not happening, what he would have sold the potato in the market at the price of 11 rupees, then maybe he would have got 1 rupees extra at what price he is selling the potato now.

Now, he is selling the potato price of 10 because this is the contract what he have sign, but actually in the market on that day the price of the potato is 11. So, in that case what is happening? He is losing 1 rupees for kg. So, he is losing, but actually he is not losing in the monetary term he is losing the notional in the notional talk. Anyway it is a loss for the farmer or loss for the potato seller and it is a gain for the ITC. Because, if ITC would have bought this potato from the market on that day; then he would have paid this 11 rupees. So now, it is a notional gain for the ITC and notional loss for the farmer.

Situation can be reverse; let in the market the price is 9 rupees or 8 rupees, then the farmer is the gainer in that seller is the gainer the seller is getting 10 rupees which is 2 rupees extra then the because the market price is 8 piece. And, it is a notional loss for the ITC who is basically losing 2 rupees for kg, he would have brought the potato from the market then you would have got at a price of 8 rupees per kg.

So; that means, the contract it was made this payoff from the contract depends upon the price of the fundamental good, here the fundamental good is price of the potato. Potato is the fundamental good and the value of the contract basically varies loss and gain and the payoff all these things are changing due to the change in the market price of the potato on that particularity; that is why what we are telling that this price is derived from the actual fundamental price.

So, that is why we say that it is the instrument whose payoff depends on the most primitive or fundamental good. So, this particular here we have taken the example of the potato, but this may be the in the place of potato this can be a stock, this can be bond this can be anything. So, if the price of that contract depends upon any kind of for the payoff depends upon any financial instrument stock, bond or interest rate and all exchange rate and etcetera we call them financial derivative.

If the price depends upon the commodities like grain coffee, orange, gold, silver all these things these are basically the commodity derivatives. So, here only differences in terms of the whatever instruments you are using, whatever fundamental good on what basis the price of the contract is based upon on that basis we can name them whether it is a commodity derivative or whether it is a financial derivative, that is the way the derivative is defined.

Looks very simple, but in general sense it is not simple, because the pricing and complexity comes whenever the different kind of further conditions comes come into the picture. Anyway these are the basic concept of the derivatives whatever way we define it.

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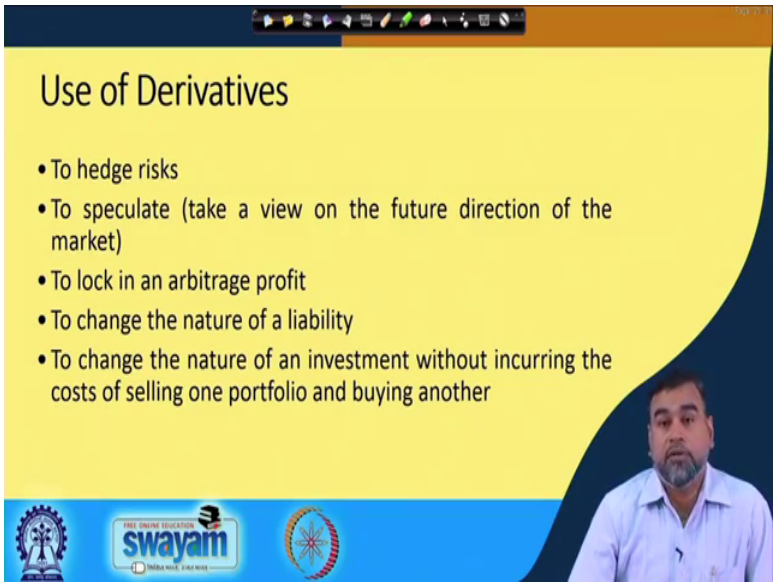

How the derivative is used already you have seen, that first of all the derivative is used to has the risk because here we are hedging the risk. Here the example whatever we have taken, you are basically hedging the risk either you are gaining or you are losing that is a different issue, but you try to hedge the risk from the market. So, what you can do if you can take two different positions, one position in the swat market another position in the derivatives market if the reverse position in the derivatives market, then basically you can completely hedge your risk.

You can speculate by predicting that how the market is going to behave. So, accordingly if you are using it speculation, then you can also get some more return what you are spot market is giving. You can lock the profit what basically you can earn and swap kind of contract what whenever we use, because we have the different type of instruments we have futures of some swaps and all, the swaps are mostly used to change the nature of liability and the asset that we will explain further that how it works.

Then the nature of an investment without incurring the cost of selling one portfolio and buying the another. So, these are the different derivatives uses so, one by one whenever we discuss that, you can you can relate it that how this particular uses are basically working in the system.

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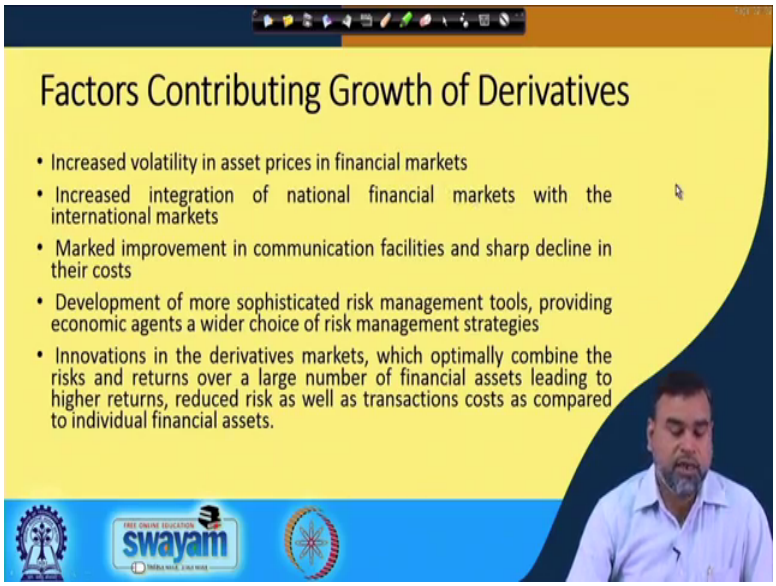

Let us see that why the derivatives market has grown in general why the hedging is mostly required? Because you know the risk can be managed by many ways. One is mostly the risk is managed through hedging another is risk is managed through insurance that already we have discussed. And here whenever you talk about the insurance here basically we are transferring the risk, but whenever we talk about hedging there is actually you are minimizing the risk because somewhere you are gaining somewhere you are losing. So, it is just like a 0 sum game kind of thing in the gain theory, that whatever you are gaining in one market the same way we are losing in another market the because of that neither you are losing nor you are gaining.

So, the total payoff will be 0 in that sense. So, why basically it has grown? Although most of the people criticize the derivatives; so, they are reluctant to use the derivatives in the market, but mostly it is a very popular instrument dissonance mostly people are using it for the speculation it. So, here the basic reason for growth of the derivatives are it increased the volatility in the asset prices in financial market and already what we have observed there is a pure integration which is happening between the financial market with the international markets.

So, that is why the derivatives related to the currency swaps and all kinds of things have grown off. And now the there is a clear improvement in terms of communication facilities and a decline in the cost of the communication; that means, all kind of trading

which is taking place these are online and the transactions which are happening in the system, these are basically most of the cases we are incurring very less cost.

So, the because of that use of any kind of exotic instruments are also grown off in the particular market over the period of time. Then, it is also we have a now developed more sophisticated risk management tools and which provides the economic agent a wider choice of risk management strategy and using the derivatives in our portfolio is also considered as a important risk management strategy or we can minimize the total risk whatever we are facing in the economic system.

Innovations in the derivatives market which optimally combine the risk and return over a large number of financial assets leading to higher returns, reduced risk as well as the transaction cost as compared to individual financial assets. You see that even if people criticize the derivatives market the popularity of the derivatives market is growing because it is basically used as a perfect instrument which really is able to hedge the risk particularly if you talk about the comparison between the smart and derivatives.

So, if you have taken the position in the both the markets, then there is a possibility that the hedging of the risk can be possible. And nowadays if you have seen there are low so, many exotic products like structured products have been developed. So, those products are mostly based upon the logic of the derivatives. So, that is why people call it there is a there is something some more risk, why you call it that products of the sometimes it destroys the market sometimes its create the problem, because we are making more complex products because the pricier price of all those complex products are based upon the fundamental price of that fundamental asset.

So, if there is anything goes wrong with fundamental pricing, then the pricing of whole process or the pricing of whole product makes disturbed or gets disturbed. So, if it gets disturbed then there is the loss in the market is quite large. So, because of that sometimes it creates the disturbance, but still it is used as a perfect hedging instrument and that which contributes the growth of the using derivatives in the system. So, that is why we can call that it is a growth driver in the economic system.

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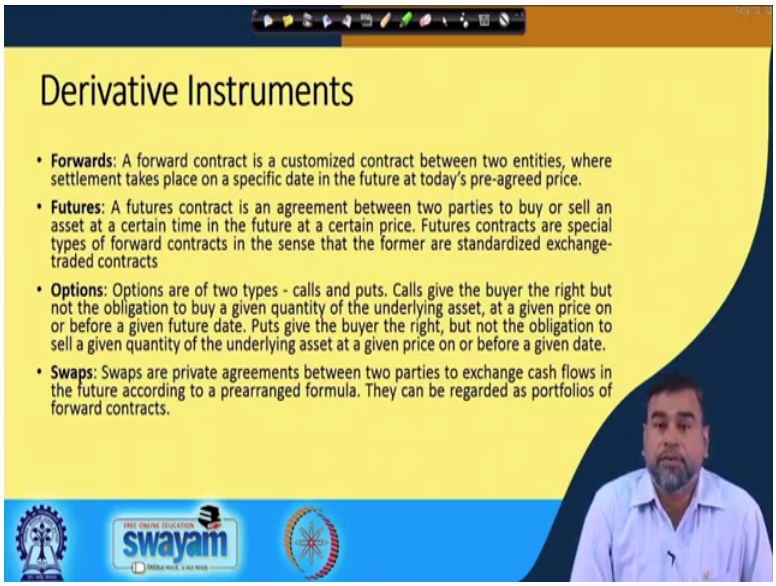

Then we will see that there are different type of derivatives instrument we see one is your forwards, then futures, then options, then swaps. Then how do define the forward? A forward contract is basically customized it is the contract between the two entities just now I was explaining one example about the potato, this can be a forward contract which is customized it is a customized contract between the two entities, where the settlement takes place on a specific date in the future, in the future or two days pre agreed prices.

So, in our example the pre agreed price was 10 rupees and the contract was between the ITC and the farmer, and here the settlement blesses a specific date it is and it is basically priced on a pre agreed price. Then we have the futures, future and forward that is not much differences, but there are some differences you can we can discuss that. It is again the future contract is also an agreement between the two parties to buy or the sell an asset in a certain time in the future at a certain price, but the future contracts are a special type of forward contracts. In the sense that the contracts in the former had standardized extended contracts and future are not basically standardized.

That is the basic difference between these two, because one contract is traded in the stock exchange and another contract is basically designed on the basis of the agreement between the two parties maybe in the OTC market: Over The Counter market. Then we have, the options here the options basically we can see the two types one is call option and put option mostly in terms of theoretical sense.

The call option basically gives the buyer the right, but not the obligation to buy a given quantity of the underlying asset at a given price on or before I give in future date. But put give the buyer the right, but not the obligation to sell a given quantity of the underlying asset at a given price on a before given date. So, this is the basic difference between the put option and the call option. So, call means buying, call option give the buyer the right, but not though you are not obliged, but in case of forwards or futures you are obliged, but in case of options you are not obliged, but you have the right to exercise that, but in case of the put option it gives the where the right, but not the obligation to sell.

Put is basically provided right to sell, call is provides the right to buy, but they are not obliged to sell or the put option holder is not also obliged to buy to same call option order is not obliged to buy put option order is not obliged to sells. And swaps are basically the private agreements between the two parties to exchange the cash flows in the future in a pre arranged formula and they can be regarded as a portfolio of the forward contracts. You will see mostly the swaps are designed to convert the asset into liability, liability into asset and as well as this has some kind of relevance with respect to the amount of cash flow what the company wants to basically use in the future.

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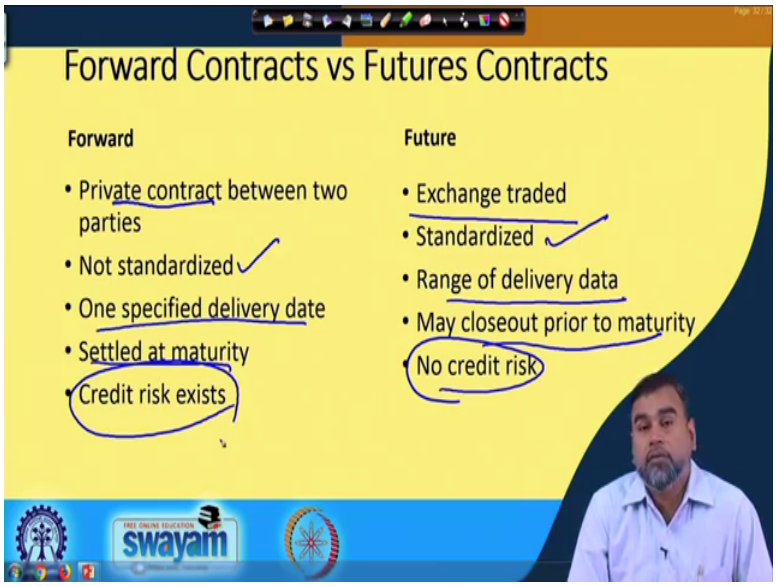

So, then we have if you see that what are those if you standardize or try to find out the basic differences between the forwards and future already I told you, both mostly the forward contract is a private contract and this is future contracts are exchange traded

forward contractors not standardized what future contracts are standardized here in the case of forward we have a one specified delivery date, but in case of futures we have range of delivery dates. You have are settled at maturity, but here it is it may close out prior to maturity, that provision is there and because it is exchange traded and that is some kind of third party involved for the trading and all these things, the credit risk is not there in case of futures, but in case of forwards the credit risk is it exists.

So, there is a possibility that maybe the execution may not materialize or the trading may not be executed at a particular point of time. So, that is why there is a concept of credit risk which exists in case of forwards, but that is not available in the case of the future. So, these are the basic differences what we can observe, although the nature of the contract for these two are same, but these two are not basically same in terms of the standardization or in terms of the trading in the market. So, these are the basic differences between these forwards and the future.

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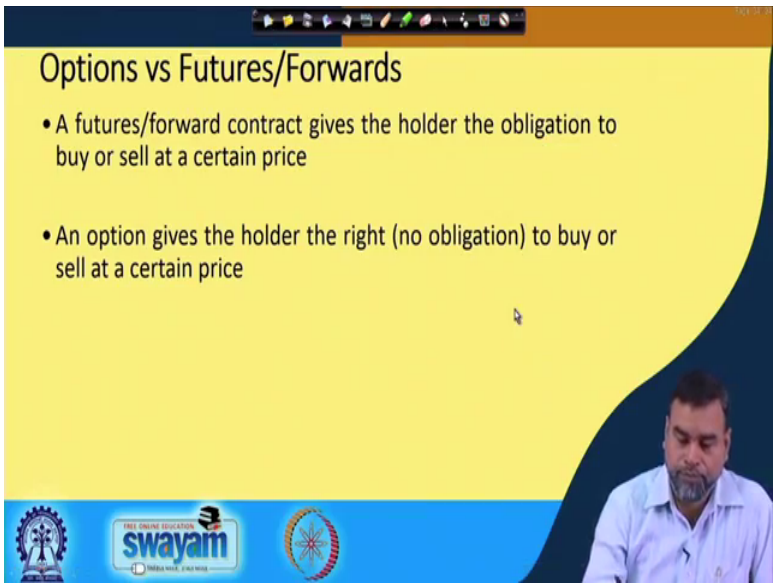

Then if you see the difference between options and the future or the forward that already I told you, that option basically future and forward contract gives the holder the obligation. It is basically provide the obligation to buy or sell at a certain price, but the option gives the right not the obligation to buy or sell at a certain price.

The option contracts may be executed may not be executed, but the forward contracts they have the obligation to go for execution of that particular order or particular contract.

So, that is the major differences between a option contract and the future or the forward contract.

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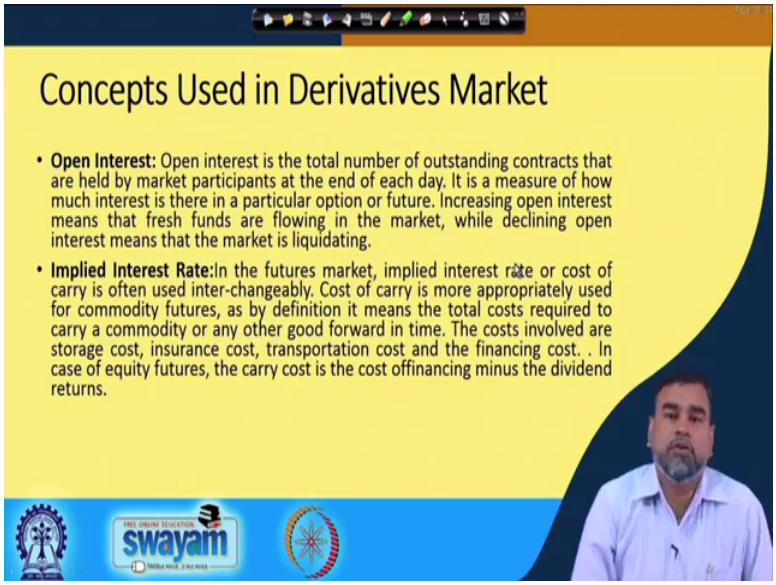

There are certain concepts always we use in the derivatives market or we deal with the derivatives, these are basically quite important from the derivatives market point of view. One is your open interest what do you mean by the open interest? The open interest is basically a total number of outstanding contracts that are held by the market participants at the end of each day. So, what it measures? It is basically a measure of how much interest is there in a particular option or the future. So, if the open interest is increasing; that means, the fresh fonts are flowing in the market, but if it is declining; that means, the market is liquidating.

The open interest rate is basically indicator that how the people are going for this kind of contract and whether the people are really going for trading in this particular derivatives market or not. If it is open interest is increasing; that means, the fresh funds are coming to the market more people are trying to take the position in the market. But whenever you see that open interest are declining; that means, the liquidity market the market liquidity is basically declining; that means, the market is liquidating. Whatever of contracts are there they are basically did execution is happening for those contracts and finally, the and all kind of transactions are happening.

So, because of that the market the number of contracts are not increasing in that context. So, it is liquidating in that sense. In the overall liquidity the gas is available it is increasing, but the fresh in flow towards the derivatives market is not coming out. Then we have another concept we have implied interest rate. So, implied interest rate is basically what due to the cost of carry which is often cost of carry an interest rate or implied interest rate which is used always interchangeably. And how it is used? It is mostly used for commodity futures as by definition it means the total cost required to carry a commodity or any other good forward in time.

So, there are some kind of cost which is involved for carrying like storage cost, insurance cost and transportation cost financing cost and all kinds of thing. So, implied interest rate is again for the financial derivatives. In case of equity and all these things if you see the carrying cost is nothing, but the cost of financing minus the dividend returns how much returns you are getting in terms of dividend and what is the cost you are incurring, because of to raise that particular equity from the market. So, in this context the implied interest rate and the carry cost more or less similar that we will use it in the future that how the concept is used in the market.

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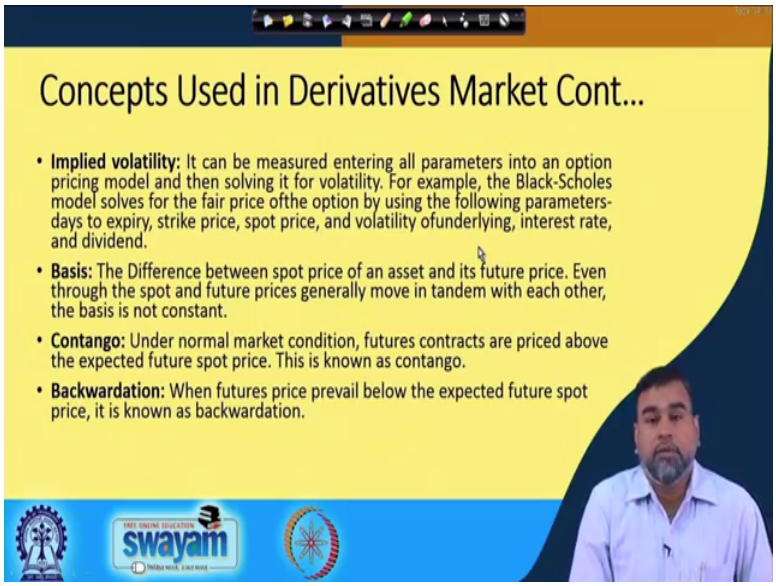

Then we have another concept called the implied volatility. It can be measured by entering all parameters into the option pricing model you see that you have you know the volatility, that is basically your standard deviation of that particular data of a particular

series over the time. But, here what is happening if there are certain formula which is available for option pricing and other and of derivatives instrument. So, they are also the standard deviation of the instrument is used.

For example if the all the data will be given to you, then you can only the standard deviation or data will not be given to you then the price of the option will be given to you the strike price everything will be given to you and then you can put all those inputs and to find out the standard deviation that is basically we call it implied volatility. What is implied volatility? That means, the volatility of that particular stock depends upon the price of the options and as well as the other inputs which are required for the pricing of the options that is why that concept is called the implied volatility.

Another concept we use in the market that is the basis; the basis is nothing, but the difference between the spot price and the future price even though the spot and future prices generally move together the basis is not constant, but in the end that basically converges. That we will we will see whenever the pricing of the derivatives we will discuss. Then we have another instrument called the contango. What do you mean by the contango? In the normal market conditions if you see the future prices or future contracts are priced above the expected future spot prices.

So, you see that future price is more than the spot price that should be generally the normal market, but here what is happening if you compare between the future contracts with the expected future spot prices, then you can define a concept called the contango. Then you have the backwardation whenever the future price prevail below the expected future spot price it is called the backwardation actually in the actual sense the expected future spot price should be more than the future price. Sorry, the future price should be more than the expected future spot price, but if it is reverse then what we can say we can call that the market is going forward sorry going backward and that concept is called the backwardation.

Two three things you have to keep in the mind; that one thing is first of all in the normal market the future price should be more than the spot price. Number 1 if the future price is not more than the spot price then there is a backwardation, but the future price in the end basically should be equal to the expected future spot price. But if the future price is not equal to expected future spot price, then the concept of the contango also comes into

the picture. You see whenever the expected future spot price is nothing, but basically the future price it should be in the end it should be same, but that does not happen.

So, that is why we have the three different prices always we observe, one is your spot price one is your future price and third one is the expected future spot price. So, in the end the expected future spot price should be equal to your future price, but that if that does not happen then this kind of concept basically comes to the picture that actually you can keep in the mind.

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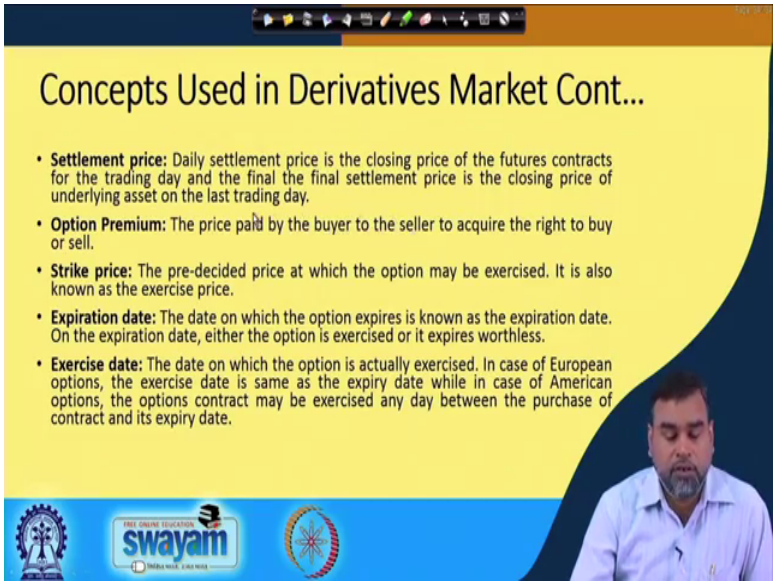

Then you have settlement price: it is the closing price of the future contracts for the trading day and the final settlement price is the closing price of the underlying asset on the last trading day.

Then out option premium: it is the price paid for the buyer to the seller to acquire the right to buy or sell. Strike price: it is the pre decided price or exercise price whatever name you can give it at which the option may be exercised it also the known as exercise price expiration date the date on which the option expires is known as the expiration date on the expiration date: either the option is exercised or the option expires worthless that we will see that when it will be worthless.

Then we have the exercise date, the date at which the option is actually exercised in case of European option the exercise date is same as the expiry date while in case of

American option the option contract may be exercised on any day between the purchase of the contract and the expiry date. So, these are the different concepts which are used in the derivatives market, which will be used for different kind of concepts and pricing of the driven etcetera.

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So, these are the references you can go through for this particular session.

Thank you.