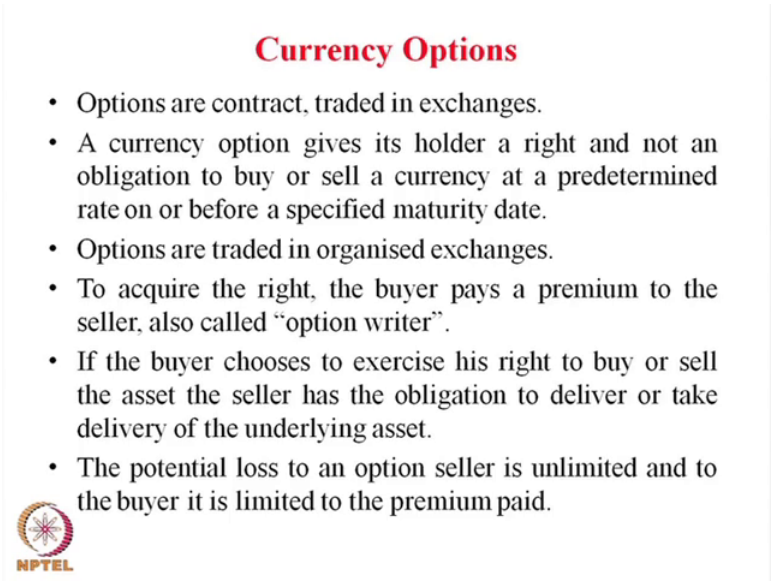
International Finance
Prof. A. K. Misra
Department of Management
Indian Institute of Technology, Kharagpur

Lecture - 18
Foreign Currency Options: Transaction Exposure Management

Let us start with session number 18. It will be in the area of foreign currency options, how you can use the options or futures, that is that is the foreign currency derivative side and manage the transaction exposure. In earlier session we have discussed how you can use foreign currency forward for management of transaction exposure. And in session today's session we will be discussing about the foreign currency options market and how you can use this options for management of transaction exposure.

As you, as we know that derivative market particularly the foreign currency derivative is very recent in case of India. To understand how the derivative market works you have to familiarize our self with the various concept of derivatives and how the derivative market works and how you can take a position in derivative, the various terminology, calculation process you have to understand. Then we can use the options, assist tools for many for managing the transaction exposure.

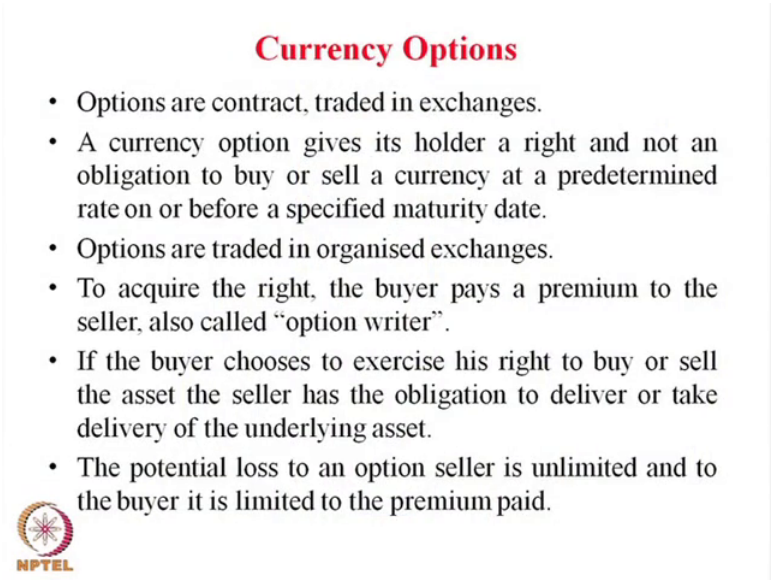
(Refer Slide Time: 02:01)



When you discuss about options just like the foreign currency forward market, options also a contract. A contract means in options market contracts are traded, options market primarily, exchange traded market; there is a exchange. The exchange act as a intermediary between buyers and sellers and through the exchange the options market work.

However, options are also available in the form of OTC market, but participant foreign currency market, the derivative market primarily look at options in exchange standard exchange traded market, because there are many advantages are there in traded fund rather than a OTC market.

(Refer Slide Time: 3:13)



When you discuss about options, options as I mention is a contract between two party. A contract traded in the exchange, primarily we are discussing about options in exchange traded side. Options are contract I am as I mentioned these are traded in exchange. A currency options gives a holder a right, not an obligation to buy or sell a currency as a pre determined rate on or before a specified maturity. In case of a options the options buyer, the options holder has the right not the obligation, the right to buy and sell currency, here underlying assets is foreign currency. So, the underlying asset they have the right on the underlying asset.

The options buyer has the right to buy or sell as a pre determined rate on or before a specified maturity date. So, there are two, three concepts here. There is a buyers, the

buyer of there is a underlying asset, there is a price and there is a maturity date. Here the buyers who purchase the options, when the holder of the options has the right not obligation. He buy at a particular pre determined price and also he can sell the options if options, he can liquidate his position on or before the specified date of maturity. On the date of maturity or the before the maturity he can liquidate his position.

So, currency option the underlying asset is currency here. The holder of the options has the right, the right to buy or sell the sell its position as a pre determined rate and a pre determined maturity date, before the maturity or on the date of maturity he can liquidate his position. Options are generally traded in organized exchanges, options are contract, these contract are traded in organized exchange. In case of India their currency options are available in NSE national stock exchange and also Bombay stock exchange. To acquire the right that is the options buyer to acquire the right the buyers pays a premium to the seller who called options writer.

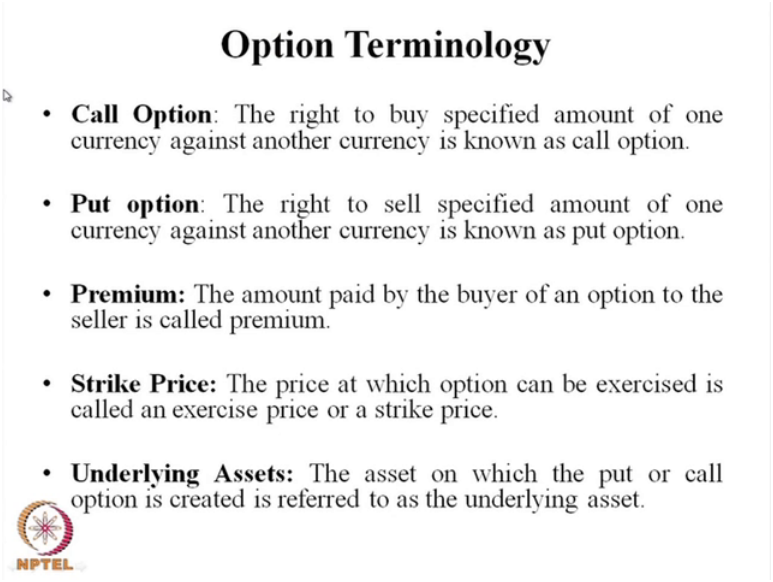
In case of a buyers and seller market of options, the options buyer while getting a right of the options is provide a premium, he pay a premium to options writer. Those are the person or the trader who give the right to the options holder, the writer of the options pay premium on for that.

If the buyer chooses to exercise his or her right to buy or sell the asset, the seller has the obligation to deliver or take delivery of the underlying asset. When options buyer got the right the options seller got the obligation. The obligation to deliver or adhere to the right of the options buyer, the underlying asset when the options seller options buyer sell or purchase the options writer, options seller has to purchase or buy, has to purchase or sell as per the contract. So, there is a right selling, there is a obligation. The right sold by the options seller and option seller got the obligation to abide by the right. By selling the right, the options buyer pay a premium to options seller. So, there is a options writer, there is a options buyer. Options buyer to get the right pay a premium to options writer when the options writer got the premium he has he has to abide by the options writers options seller right.

The potential loss is unlimited in case of options writer, but in case of options buyer the potential loss is only the premium. When he exercise his options he get the profit, if he does not exercise the option, cancel it he pay only the he his loss is limited to the

premium he paid to the options seller. So, options buyer got the, the loss is limited to the premium. In case of options seller the loss is unlimited, there is a open loss. So, it depends on depends upon the movement of the market on that basis the options seller profit or options seller buy options seller loss depends.

(Refer Slide Time: 08:48)



So, when you discuss about the options market there are many terminology associated with the options. You have to understand the options terminology. So, first options terminology is the call options, call options, put options, premium, strike price, underlying assets, these are the options market terminology or the concept. So, let us move, let us discuss about this concept so as to familiarize ourselves what actually meaning of a options.

So, call options, the call option is the right to buy a specified amount the amount of the currency against another currency. Here call options mean the person who is purchasing a call option has a right to purchase the underlying asset on or before the maturity. So, call option there are call option provide right to buy a specified amount of currency. Suppose, here the underlying asset is currency there are, the call option provide the right to buy a specified amount of one currency against another currency.

So, here suppose two currency are rupee INR and US dollar. Suppose the options buyer, option call option here the buyer wanted to purchase, call options buyer wanted to purchase dollar US dollar by surrendering Indian rupee INR. When he purchased a right

of buying a right of buying US dollar here, here the right is purchasing of US dollar by surrendering a specified amount of Indian rupee. So, call options buyer buy a options to purchase a currency against another currency. The rate is fixed at the point of buying a call options and for buying a call options, the options buyer pay premium to options writer. So, call option is the buy of, buying of underlying asset. The underlying asset is a currency, your exchange of one currency against another currency or the buying of US dollar against Indian rupee is the call options.

Put options, put options selling your, selling a particular underlying asset. The right to sell specified amount of currency against another currency is known as put option. When person buy a put options means he has some currency, he wanted to exchange that currency against another currency. So, suppose you have, suppose a importer, suppose a exporter might be receiving US dollar after 1 month. He wanted to convert the US dollar into Indian rupee. So, here the exporter receiving the US dollar after 1 month hence when he purchase the US dollar after 1 month for him the question is here, after 1 month he does not know what will happen to US dollar. So, for him it is a risks so he wanted to sell US dollar after 1 month, so he purchase a put option. The put option here, putting the US dollar for after 1 month. So, when he purchase a put option so he pay a premium, he pay a premium for that and put option suppose he purchased after 1 month when he surrender the US dollar he will be, the US dollar rate is 52 rupees.

If it is after 1 month suppose the spot market dollar is available as dollar rate is 51 rupees, he will sell his own dollar at 52 rupees. So, he will be in a profitable position. Suppose, the US dollar become 52 50 in place of 52, it is 51 rupees 53 rupees suppose, then he will not exercise a put option, he will cancel that put option by paying the premium. So, his loss limited to premium only, but he can sell the US dollar in actual spot market and get 53 rupees per dollar. Put option is putting your underlying asset in the market, call option is buying the underlying asset from the market.

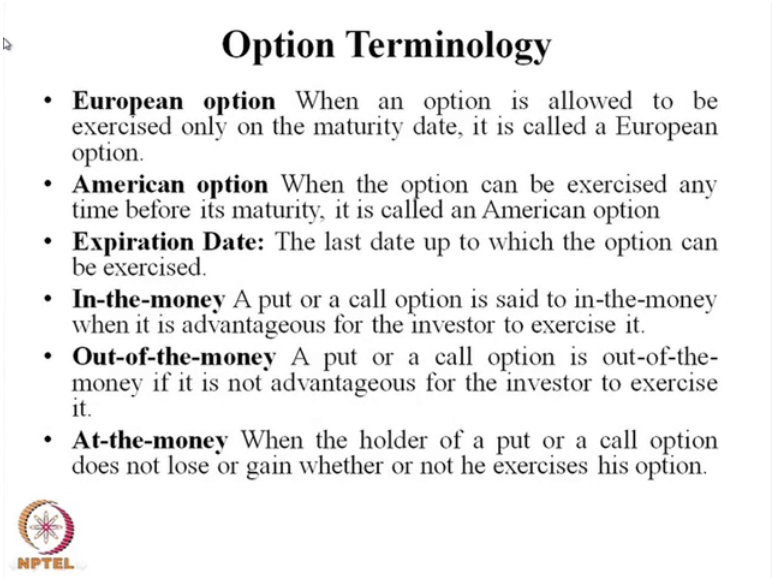
Premium, so when the, the put options holder or the call options holder buy options he, he has to pay a premium. The premium is decided by the market forces. Generally the underlying asset volatility and the maturity period decide the premium. The options writer get the premium and options seller pay the premium. The how the options writer decide about the premium, on the basis of volatility of the underlying asset and the maturity period he decide the price of the premium. The premium itself decided by a

number of models are there, for deciding about the premium and the primarily Black Scholes model of call option, put option, price, market people or traders are using this and the premium is the options writer, options writer price he is supposed to get it and the seller the options, options buyer pay the premium to the options writer.

What is the, some another terminology is the strike price, at which rate you are buying the, the buying the options, the strikes price. Strike price is the options, the price at which the option can be exercised, at which rate you are exercising the options that is called strike price. At 52 rupees after 1 month dollar options is exercised, then its strike price is 52 rupees.

Underlying assets, there are another terminology underlying asset. Underlying asset for which the options buyers, buyers and sellers are selling the underlying asset may be equity, maybe currency, maybe anything. So, underlying assets on what basis underlying asset on what the options are created, that is underlying assets. On underlying assets options are created. The price of the option depends or the premium of the option depends upon the underlying asset volatility. So, there is a underlying asset on which whose values are changing on that on that changing value options are created.

(Refer Slide Time: 16:26)



Then another terminology here options or European options or American options, it depends upon the exercise when you are exercising option, on that basis European options and American options the terminology depends. Here suppose in case of

European options option can be exercised on the maturity date, that is suppose you have signed a option for 1 month or only on the date of the maturity after 1 month only you can exercise the option, then it is a European option.

In case of American option you can exercise the options any day during the maturity period. So, European option American options are open and European options some sometime you can call it a closed option. Only on the date of maturity you can exercise. American option is open till up to the maturity date anytime you can exercise your options.

Another point is here, terminology is here expiration date that is the maturity date, expiration date. Last date up to which the options can be exercised, the maturity date is called expiration date. On which date the options is exercised or the last date of options exercising date is the maturity date or expiration date.

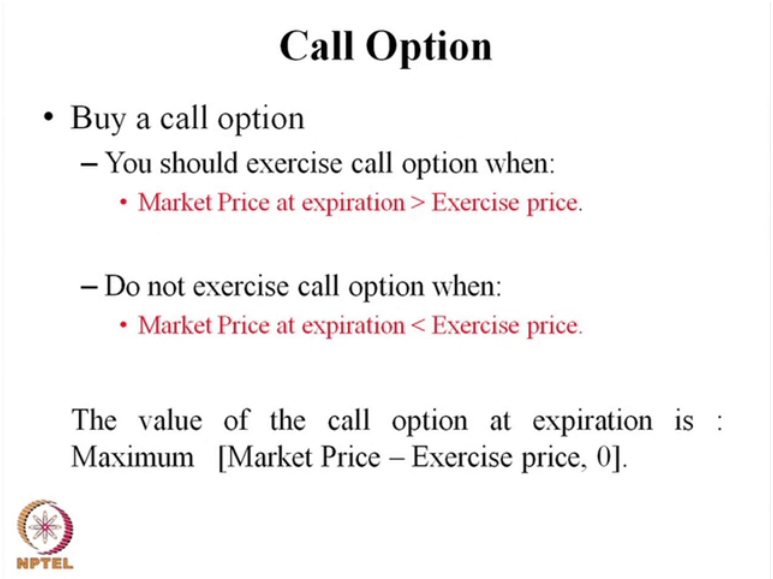
There is another terminology called in the money. A put option in the money or out of the money or at the money there are three concepts in options that decide about the profit, about the position of the option, about the profit. Profit is available to the options buyer or options seller, in the money, out of the money and at the money.

In the money a put option, put or call option is said to be in the money when it is advantageous for the investor to exercise it. In the money means the options buyer whether he has purchased a put options or call option, so long as it is advantage for him to exercise the option it is called the options buyer is in the money. Because in the money means the options buyer whether is a whether he has bought a call option or put option is in profit is called in the money.

Out of the money means the options buyer that is a put options buyer or the call options buyer is not it is he is not getting profit, his disadvantage position his means he is out of the money. At the money means he is neither getting a profit nor getting a, nor getting any kind of loss so he is immaterial or indifferent to the option, holding the options. So, gain or loss are same. So, he is not exercising the options so at the money. He is indifferent about the option whether he is, there is no options, there is no opportunity for the options buyer to exercise the option is called at the money neither he is getting any profit nor getting any loss so at the money. So, in the money the options buyer in

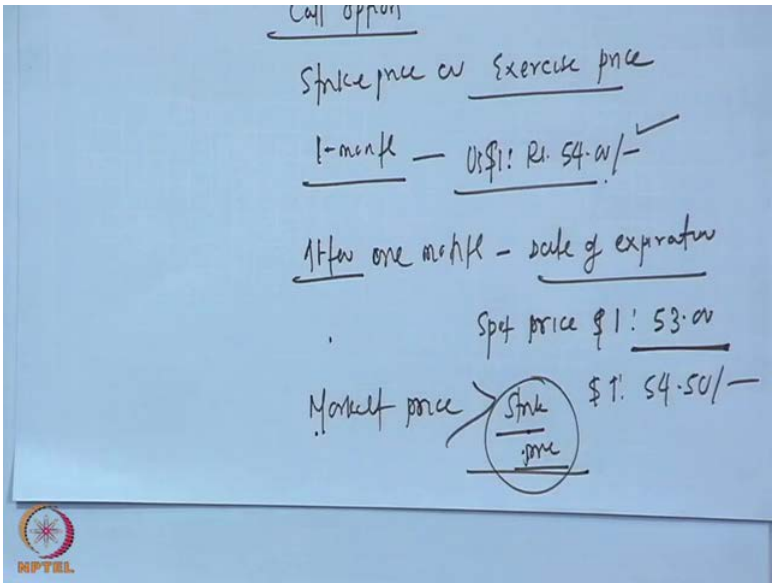
advantageous to exercise, out of the money the options buyer in disadvantageous to exercise the options, at the money the options holder is indifferent.

(Refer Slide Time: 20:03)



Now, let us discuss about the call options. The call option, when you buy a call option when you want to exercise your option. So, buy a call options means you are buying. Suppose your currency you wanted to purchase a US dollar you are buying a call options, when you buy a call options when you will exercise, it depends upon the market position your strike price and the market position. So, when you will buy a call options? The market price at the date of maturity is more than the strike price because here you have to understand that when you purchase a call option, suppose you purchase a call option.

(Refer Slide Time: 24:09)



The, as a buyer you purchase a call options means you have a strike price, strike price or we call it exercise price, you are exercising at a particular price, exercise price. So, suppose 1 month, 1 month you purchase a US dollar, after 1 month you want to purchase US dollar, you purchase a call option, you sign a call options contract with the call options seller. Suppose, after 1 month you purchase a strike price it 54 rupees per dollar you exercise a per dollar US dollar 54 rupees after 1 on expiration of the call since you have purchased a option, a 1 month option so in India we generally call a follow the European exercise because at the date of maturity exercise the options, European options we follow. So, 1 dollar up to 1 month, till 1 month 54 rupees, at the end of the 1 month that is expiration date you get dollar, you should exercise the option, the options seller will give you 1 dollar for 54 rupees.

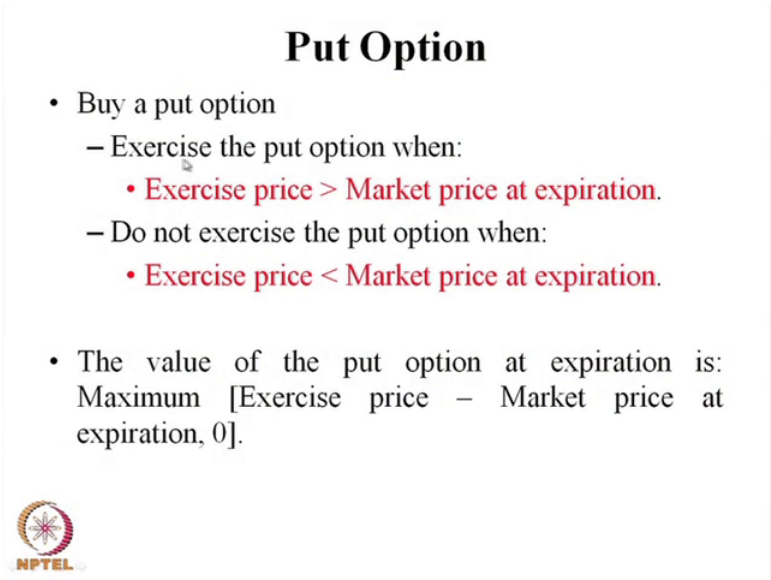
Suppose, after 1 month took this, suppose after 1 month, after 1 month that is the date of, that is the date of the maturity or expiration, date of maturity of the option or expiration date the spot price, spot price of dollar, 1 dollar suppose it is available at 53 rupees. So, but you will be 53 rupees available the spot price whether, but you have sign the options 54 rupees. So, you will not exercise, you cancel the options, you will not exercise the option, but in place of that you will get dollar from the spot market at 53 rupees.

Suppose, after 1 month dollar is available at 45.50. What you will do? Spot market giving you 54.50 but you have signed options with the options in the market. So, you

have the right to get dollar at 54 rupees. You will exercise these options 54 rupees so you will get cheaper. So, this is called call option, when the call option will be profitable when the market price is more than the exercise price. The call option is profitable when market price, market price is more than the strike price or exercise price. The price on which you would sign the contract that price, market price is larger than that or more than that then your exercising options, there is a profit for you. So, call option will be profitable when the market price at the date of expiration is more than the strike price.

Now, what is the value of the call option, value of the call option nothing but I have written here the value of the call option is market price minus the exercise price. So, value of the call option is that. How much value of the call option here, when here suppose market price is 54.50, but you have your contracted price is 54 the call option value is 50 paise here per dollar, so is called call option bias.

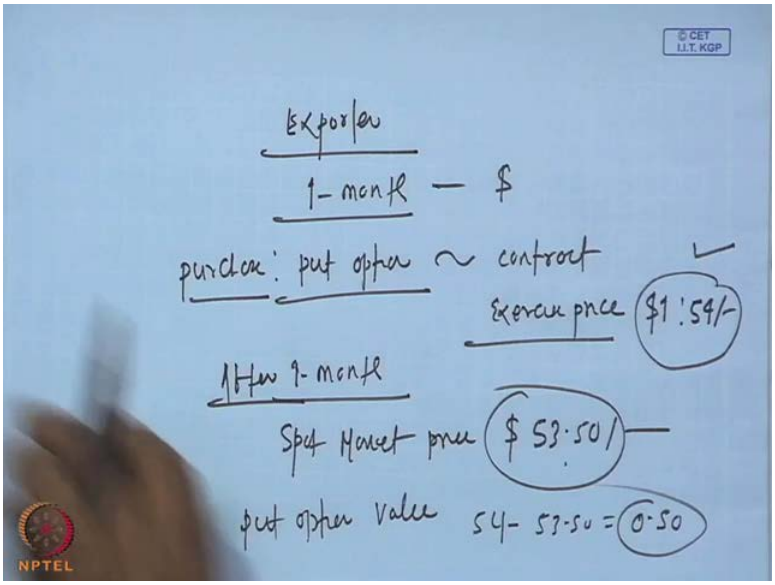
(Refer Slide Time: 24:34)



Suppose, you are a put options, what is a put option you are purchasing a put option mean you are putting your foreign currency in the market, you are so what your are putting? Suppose, you are a exporter after 1 month you are getting the dollar. So, you want to put the dollar sell the dollar in the market, what you purchased you purchase a put option for dollar. So, you are selling the dollar in the market. You have to go to the trader, options trader you ask him after 1 month I will be getting dollar, give me a quote for that for options. He will give you a quote for options that is a strike price, you sign a

contract with the options seller and purchase a put option. The put option you are purchasing the put option that is a strike price or exercise price and that time you decide after 1 month what will happen to dollar rate on that basis you can sign.

(Refer Slide Time: 28:16)



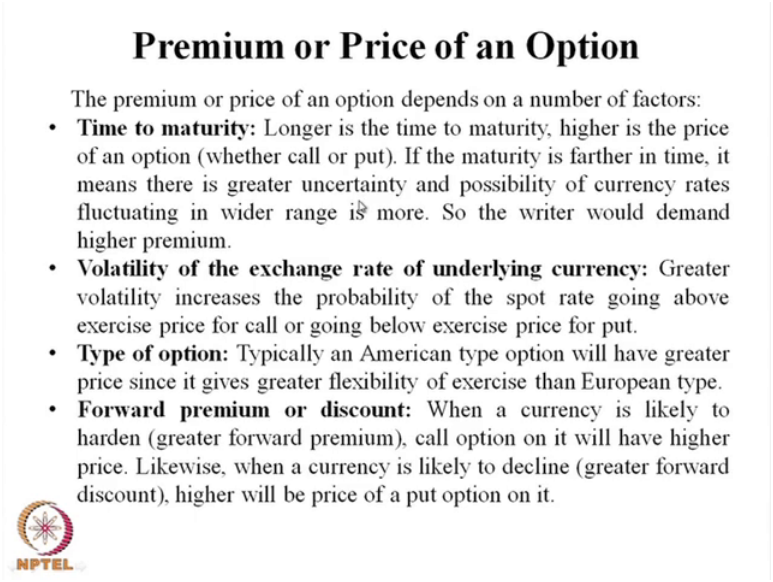
Suppose, here you are you are discussing about the put options here, put buy a put option exercise put option, when you will exercise the put option. Suppose, put option you are exporter, after 1 month you are getting dollar, after 1 month you are getting US dollar and you sign a, you purchase a put options, you purchase a put options and sign a contract with the put options seller, contract of what exercise price or the strike price that is suppose you sign a contract with the what is that 54. 54 rupees per dollar. So, when you sell the dollar the options seller will give you 54 rupees after 1 month.

Now, after 1 month, after 1 month in the market, spot market the price of dollar is available at 53.50 what we will do, what is the value of your put options here whether you will exercise the options, depends upon, depends because in the when I surrender the dollar in spot market I am getting per dollar 53 rupees 50, but I have signed a contract with the options seller by a put option, I purchase a put option I can put my dollar in the market to the options seller at 54 rupees. So, I will get this because here I am getting more rupees than and than in the spot market.

So, by put option value, my put option value put option value is how much? 54 minus 53.50 that is a per dollar 50 paisa. So, here put option when you will exercise? When I

will be exercise my put options when the market price is less than the my strike price. So, my exercise price is less than my market price that time I will exercise my put option that time only here the exercise price is what? 54.54, but my market price at expiration is 53 rupees. So, I am putting my dollar and getting 54 rupees, so I will exercise that.

(Refer Slide Time: 28:18)



Now, come to the premium or price of a options, the call option, put option, this is the terminology only. So, here put option and call option, call option mean I have to sell the dollar and put option mean I have to purchase, it depends upon my way of defining the call option and put option. Now, suppose I will be, we will be discussing about the premium of the options, premium means or price of an option. My price of the option depends upon the premium I paid because when I sign a contract with the options seller, the options seller get premium for me. The question is here how the options seller decide about the premium. The premium depends upon I as I mentioned on the underlying asset, what kind of asset on which the options are being, options are being retained. The asset is highly volatile asset, the asset is a stable asset, the volatility is less on that basis also options premium decide.

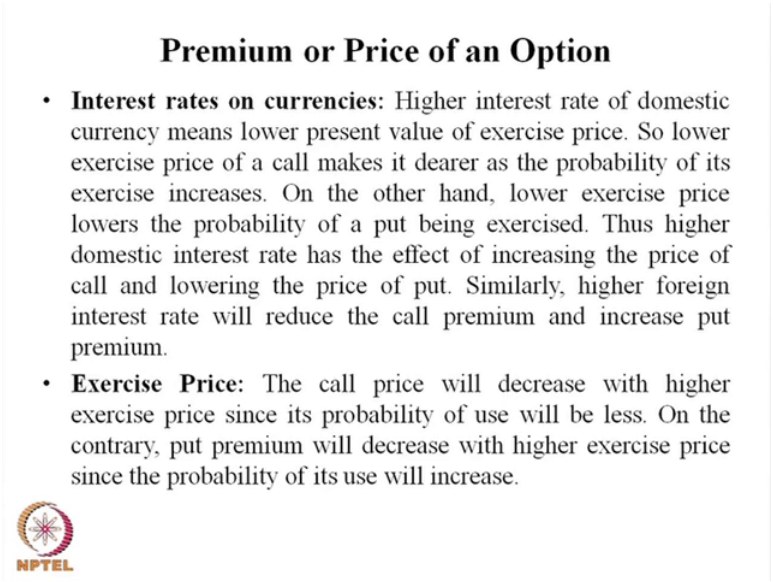
So, the primary variable for options premium is the time of expiration. How many for how many days I am writing the, I am getting the options, I am holding the options. The time of expiration 1 month, 2 month, 3 month depends upon the time of expiration. On the time of expiration only the option premium decide. So, another part is, one part is

time of expiration that is the maturity date, another part is on which I am getting the options, the what is the underlying asset.

The underlying asset is highly volatile then my options premium will be very high. So, price of the volatility of the underlying asset also a part of a determinant of determinant of options premium. Then whether that particular asset is a forward premium or discount because it depends upon the interest rate differential, incase of currency if the discount currency or a or a premium currency that also decide, that also part of the determinant for the premium calculation side. So, a forward premium or discount when the currency is likely to be hardened that is greater in forward premium. So, likely to harden means is the premium currency the on the call option on it is to be higher price.

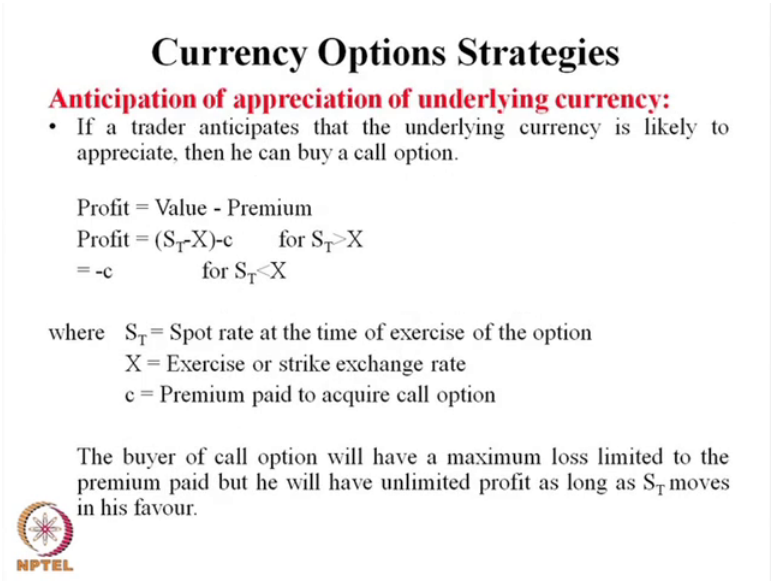
Likewise when the currency is likely to decline the discount currency, the put option on it will be higher. So, depends upon the in case of underlying asset is currency if the currency is appreciating currency, the call option will be higher price. If it is a currency is a discount currency the put option value will be high. So, call option, put option on that basis of currency, on the basis of currency forward or the currency discount that also part of the determinant of forward your options premium. So, the primary aspect is here the time of maturity, the time of expiration, the volatility of the underlying asset and also in case of currency it is a forward currency or a discount currency. On the basis of that the premium for the option decided. Then the forward premium also it depends upon the forward premium of discount, also depends upon what?

(Refer Slide Time: 32:08)



The interest rate the two currency is a US dollar and Indian rupee, what the interest rate differential between two country that also price that also that also part of the determinant of forward, your options premium. Similarly, exercise price. Exercise price is likely to likely to fall or likely to increase. The probability of the exercise price, likely to increase or likely to fall also a part of the determinant of a currency options premium.

(Refer Slide Time: 32:43)

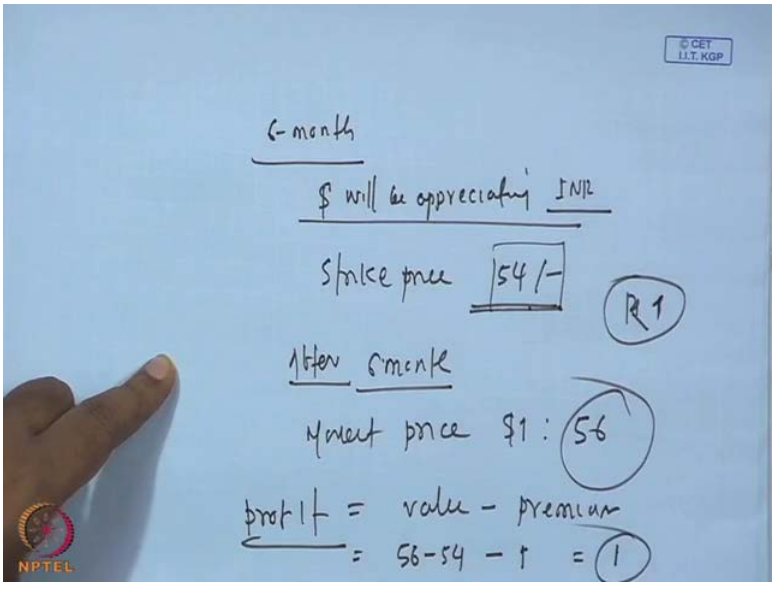


Now, when there are strategy of currency options premium. The strategy of for available in the market are many strategies you can decide, but we have discussed here 2 to 3

strategy and how you can take a position as a trader in the currency market, particularly options market where you can use different strategy to get profit out of the options market. Suppose, there is a anticipation of appreciation of underlying asset currency. The currency there is a probability that the currency will appreciate what will be your strategy? My strategy whether my currency is going to appreciate, your currency is going to appreciate then what I will do? I will go for what you will call a buy a call options because I want to purchase the asset the currency, the particular currency is going to appreciate US dollar.

Suppose US dollar, US dollar now 54 rupees going to appreciate, it will be 53 rupees, going to US dollar is going to appreciate it is 50 in place of 54 it will be 55. So, US dollar appreciating what I will do? I purchase US dollar. I write a call option, I will purchase a call option. As a trader I will purchase a call option because if I purchase a call option now when actually dollar will be very high that time I will sell it. So, I would purchase a call options now because my thinking or my, I am predicting that the currency is going to appreciate its value the appreciation value that particular currency you have to purchase it as a call option. So, my strategy for in case of a, in case of appreciation of underlying asset currency I have to purchase the call option. So, I will purchase the call option.

(Refer Slide Time: 36:42)

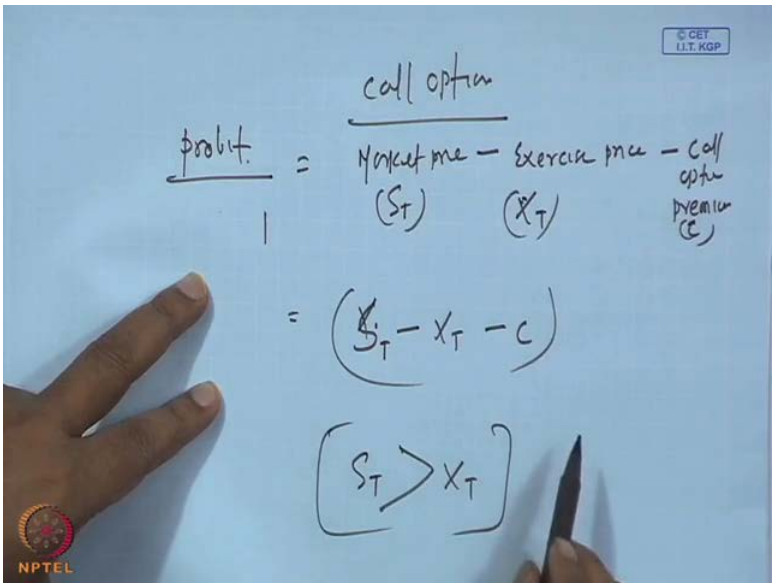


Suppose, I purchase call option for 6 month. I predict now after 6 month the dollar will appreciate US dollar is will be appreciating, will be appreciating against Indian rupee. So, Indian rupee against Indian rupee INR dollar is appreciating. So, I will predict that, I am predicting that I will purchase a call option now. Now, call option purchase means I will purchase dollar. So, I will go to the options seller ask for to give a quote for the options for the US dollar call option.

Suppose, he has given a strike price 54 rupees per dollar after 6 months, after 6 months I will purchase this call option, after 6 months dollar become after 6 month and actual expiration date come after 6 months, the market price of dollar is per 1 dollar, dollar is appreciating it is 56 rupees, dollar is appreciating, I have predicted dollar will be appreciating so on that basis I take a, I took a position in the call options market by purchasing a call option. So, but I have signed a contract with the call option seller to give me dollar after 6 months 54 rupees. I will take 54 rupees from him and sell in the market dollar 56 rupees and get a profit of 2 rupees per dollar. So, profit will be my profit, but I have to pay a premium for that, my profit depends upon the value minus the premium.

Suppose, here I premium I paid a premium of 1 rupee, per contract. So, I my value of call options here 54, my value of call option here 56 minus 54 and I paid a premium of 1 rupees, my profit will be 1 rupees per dollar, 1 rupees per dollar, this is the profit position of the call options buyer.

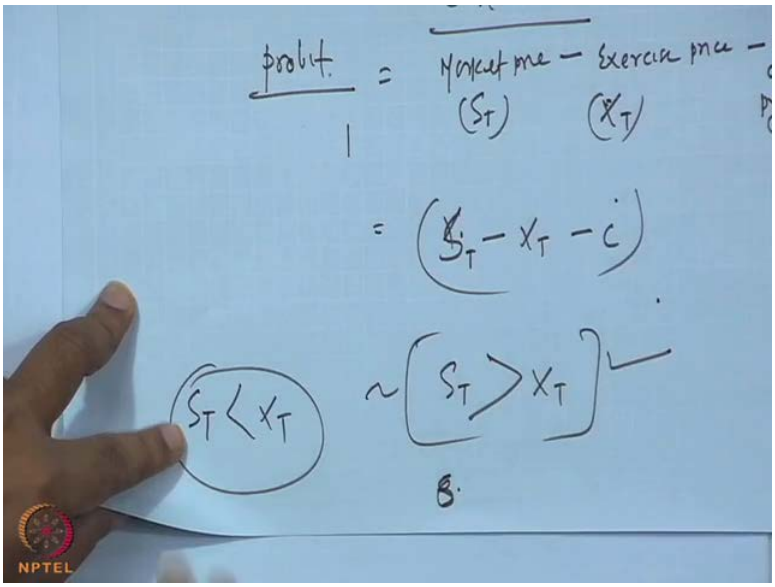
(Refer Slide Time: 38:15)



What is the position here because here the profit is strike price minus the exercise price. I am exercising the what is the profit here in case of a appreciating currency, in a appreciating I have estimated that a currency will be appreciate so call option, call option profit will be call option profit will be my profit is equal to I am my profit will be how much that market price.

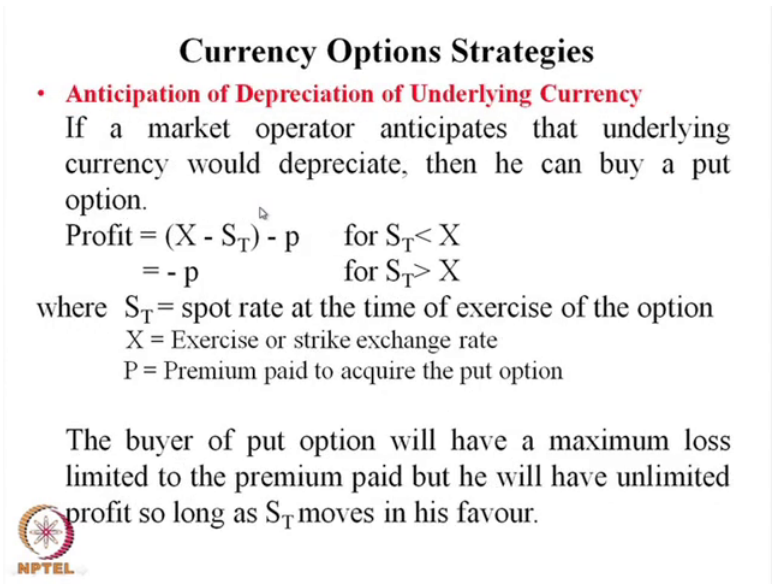
Suppose, market price is S t minus my exercise price on what rate I purchased the exercise price, suppose I put here X t and my call options call options premium I put C. So, my profit will be S t minus X t minus C, that my profit will be this. When I will be getting profit in case of call options if S t that is market price is greater than X t, then only I can get a profit other than it will be loss for me, what is the loss for me suppose market price S t, the S t market price here only then I get a profit here.

(Refer Slide Time: 38:41)



Suppose, in place of that S t is less than X t then what will be that I will not exercise option my profit will be a loss, what is a limited loss limited loss is my C only that is a call options premium, how much I paid the premium that is my loss. This is called the suppose you anticipate that call option, call your currency is appreciating take a position for that particular currency by in the form of call option expire.

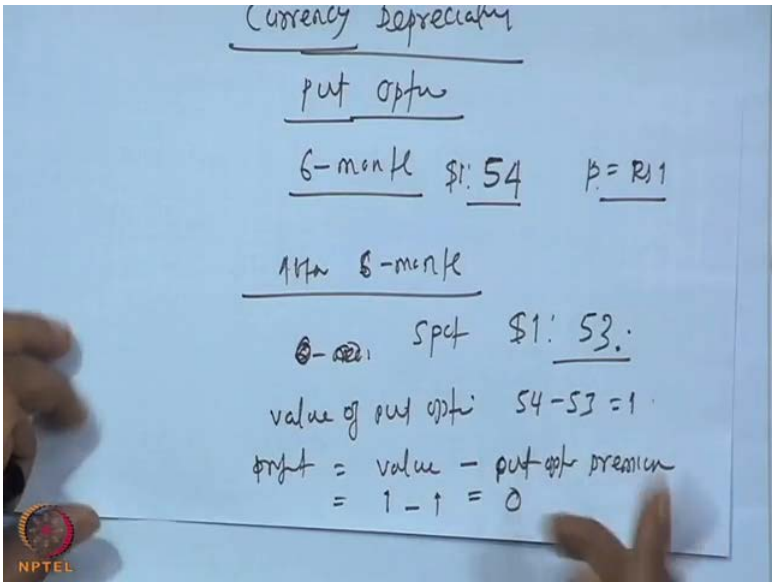
(Refer Slide Time: 38:59)



Suppose I anticipate that a currency would depreciate. A currency is depreciating. So, similarly, what I have done it, a currency is depreciating currency, currency is

depreciating. What I will choose? Depreciation currency I should purchase a put option, I go for a buying a put option, what I will do.

(Refer Slide Time: 41:53)

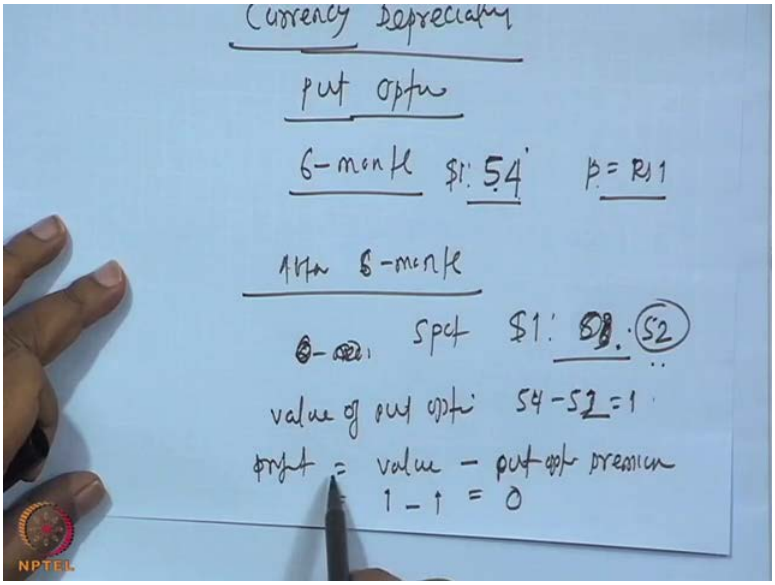


Suppose, put option I have to buy, then I will be put option, I have to buy a put option. Now I have, now I go suppose I buy a put option for 6 month for US I assuming, I assume that US dollar is going to appreciate depreciate that means I put suppose I am I put a I that options seller, the put options seller gave me a quote of 54 rupees per dollar after 6 month I have when I want to put my dollar I will get 54 rupees per dollar and for this, for this he charge a price put option price I put p, put option price, put option premium, put option premium per option 1 rupees. After 6 month I have got my dollar I sell in the market.

Now, I will suppose after 6 month. Now, in actual market it is a spot market dollar is 1 dollar is available at, 1 dollar is available at dollar is depreciating, rupee is appreciating so dollar is available at 53 rupees. Here I have predicted the dollar will depreciate, rupee will appreciate. So, in place in the actual market after 6 months dollar become 53 rupees. Now, what is the value by, value of my put options? Value of my put option, value of my put option because now my exercise price is 54 rupees, but market price is 53 now. So, my value of the put option is market price, the exercise price minus the minus the spot price or market price I am getting here 54 minus 53 1 rupees, but my what is my profit? My profit is depends upon the value, value of my put option minus put option premium

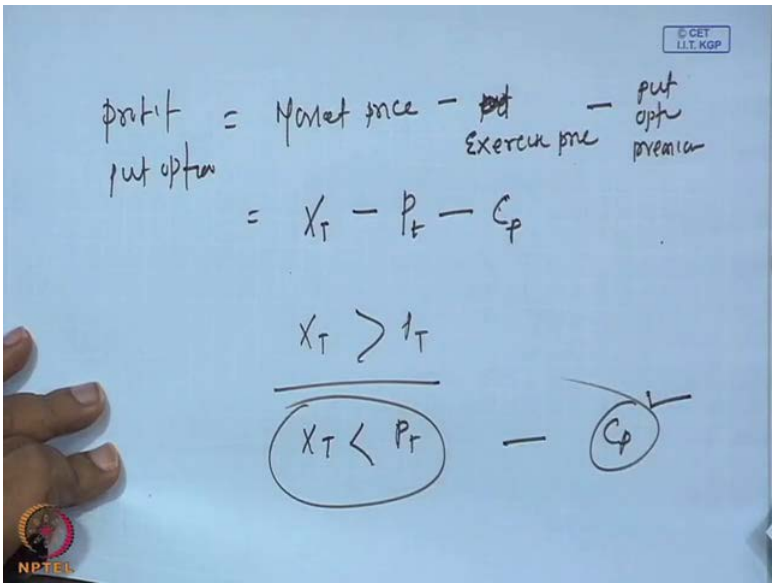
put option premium, put options premium, put option premium is 1 rupees so my value is 1 rupees put option premium is 1 rupee, I am getting 0, I am indifferent whether to exercise the options not to exercise the option I am indifferent now.

(Refer Slide Time: 42:26)



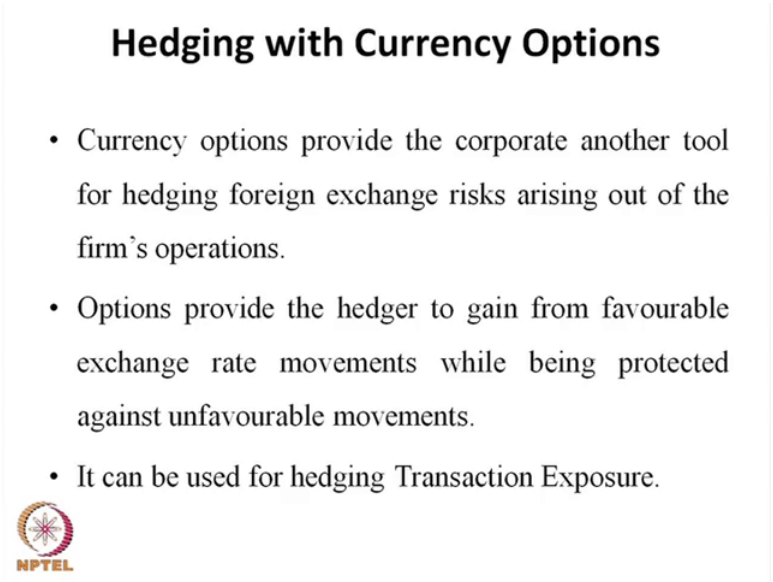
But suppose in place of 53 rupees it is 50 52 rupees. So, my value will be now value will be 50 value will be 54 minus 52 because I sign a contract put option contract with the option seller 54 rupees to sell dollar, but market price is 52, I will sell the dollar to put options seller I get 54 rupees, but market is again 52 rupees. I get a value of my put option 2 rupees, but I paid a premium of 1 rupees put option premium, So I am getting a value of 1 rupees, I will exercise the put option now.

(Refer Slide Time: 43:51)



Then what is the part is here my, I mention here profit will be, profit of put options, profit of put option is market price minus put options price, that is you have exercise price you have a sign put option exercise price and minus the put option premium. Suppose, here I put the market price is X t, exercise prices I put here put option exercise price I put P t and put option premium i put only C p. So, when it will be profitable when X t greater than P t then it will be profitable for me. Then I will exercise the put option and I will get what is the value available to me, but when a loss for me when X t is more than the P t is a loss for me that time I will not exercise the put option, I will surrender only the, only the put option premium. The loss is, loss is for me the loss is available for me only C p that is the put option premium, but when I am getting a profit it will be X t minus that is market price is more than the put price. So, that is called in case of anticipation of, anticipation that dollar or the a currency is depreciating in value. If the currency is depreciating value you have to purchase the, you have to sell the currency that is how you buy a put options for that currency then you will get a profitable position.

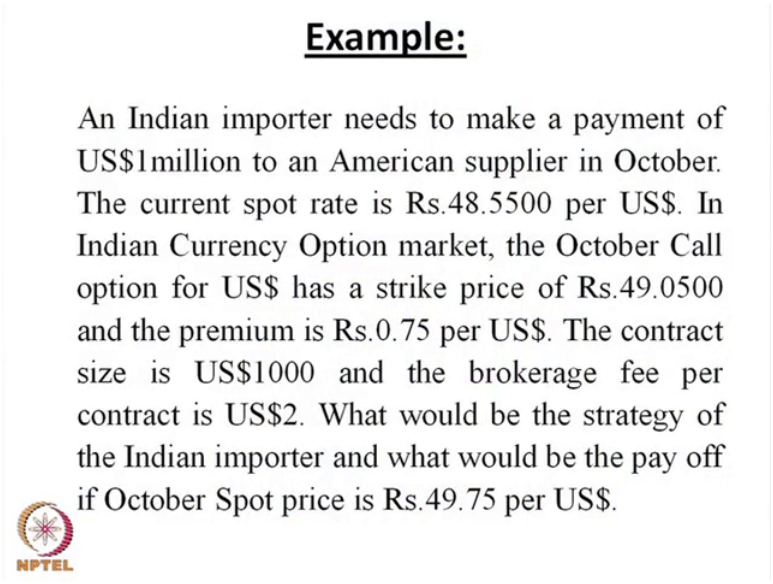
(Refer Slide Time: 44:17)



Now, hedging with the currency options, how you can use the currency option hedging strategy. Currency options provide the corporate another tool for hedging foreign currency, foreign exchange risk raising out of form separation. By looking at the firm operation they have the foreign open position in foreign currency they can use the currency options strategy and close their positions by purchasing or selling of, by purchasing or buying of call option or a buying a put option. Options provide the hedger to gain from favorable exchange rate movement while being protected against unfavorable movement. If there is a purchase options your gain is unlimited because it depends upon the movement of foreign currency, but your loss is limited to your premium, only the premium you paid for that.

Similarly, it can be used for hedging the transaction exposure if a open position in any foreign currency, suppose you are exporter and you expect that currency your open position is there, you can purchase a put option. You are a importer you want to purchase foreign currency you anticipate that foreign currency is appreciating you go for a call option. These are the, these are the availability for you by combining the call option and put option in a different format different, what is called different way combination you can rib the market and the corporate have been doing these through call option put option combination, designing different strategy for hedging their open position.

(Refer Slide Time: 46:05)

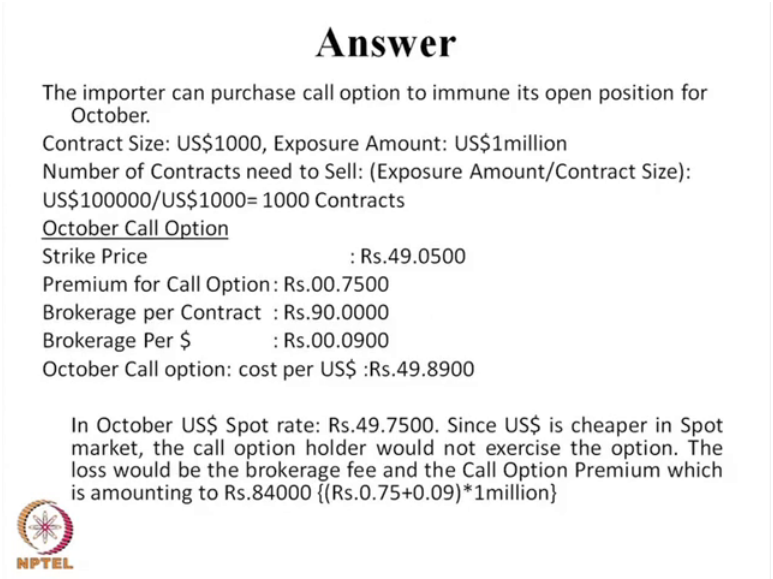


To understand the put option call option let us do a in a problem. The problem is here, a Indian importer need to make a payment of a 1 million US dollar to an American supplier in the month of October, he needs the Indian importer needs 1 million dollar in the month of October, the current spot at present the spot is 48.55 for purchasing dollar and in the Indian options market the October call because the importer need 1 million in the month of October, in the options market October call at present is having a strike price of 49.05, in the premium per US dollar is 75 paisa and contract size is 1000 dollar and the brokerage fee per contract is 2 dollar. What would be the strategy of Indian importer and what would be the pay off if the October price is 49.75.

What the, what are the variables given to us? It is a importer, he needs 1 million dollar in the month of October, current price of the dollar is 48.55, dollar is appreciating, rupee is depreciating. So, importer have need to pay more per dollar, more rupee per dollar so he wanted to immune his position. He has gone to the foreign currency market that is options market in India, he saw that October call options because he need he need dollar he want to purchase the dollar, so he have to purchase a call options. So, October call option Indian foreign options market is running at strike price of 49.05 and if you want to purchase options per dollar the premium he has to pay 75 paisa per dollar and he has to, he has he has gone to a options market to purchase a contract so per contract per contract the fee is 2 dollar and 1 contract size in Indian options market is 1000 dollar and suppose

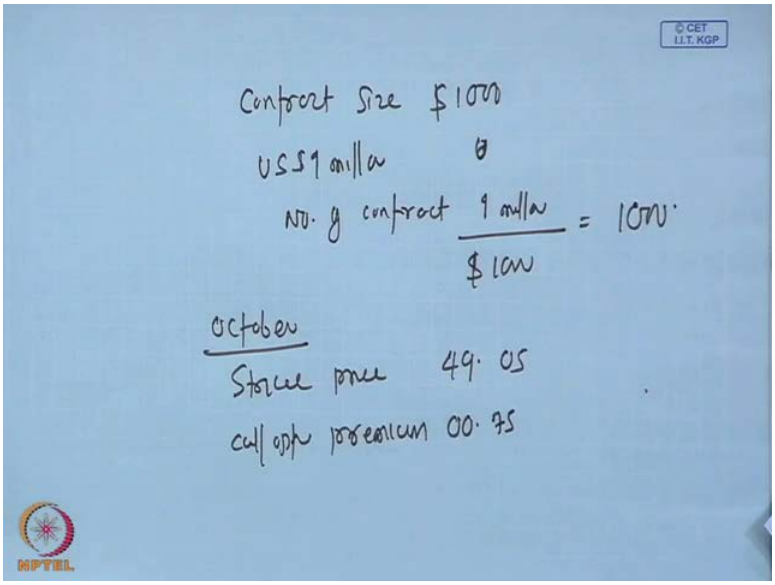
the October spot price is 49.75 what will be strategy? What is the pay off for I mean what you what way you can immune his position, this is a problem given to us.

(Refer Slide Time: 48:21)



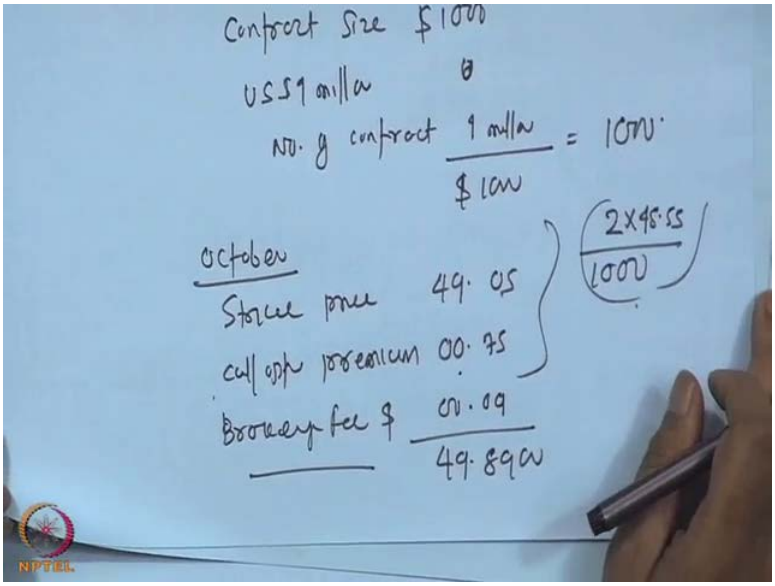
Now, what we will do that the importer need to purchase US dollar so he had to buy a contract. The contract size is 1000 dollar so per 1 million. So, how many contracts he has to purchase 1 contract size contract size is 1000 dollar per contract, so he need US dollar 1 million.

(Refer Slide Time: 49:40)



So, 1 million US dollar, so how many contract number of contracts will be, number of contract 1 million by US dollar by 1000 dollar, he need 100 1000 contract, he need how many contract 1000 contract. So, 1000 contract he need. Now, October position, October what is the strike price? If you see it is a strike price of October call option is 49.05. Now, what is a call option premium, call options premium, call option premium is 0.75 paisa per dollar, then brokerage fee how much, brokerage fee per brokerage fee is given to us, the brokerage fee is 2 dollar, 2 dollar per contract, that is 1 contract is 1000 dollar, so 2 dollar per contract means 1000 divided by a 2 divided by 1000, that is and plus this will be converted into Indian rupee. So, what is the current strike current price is 48.55.

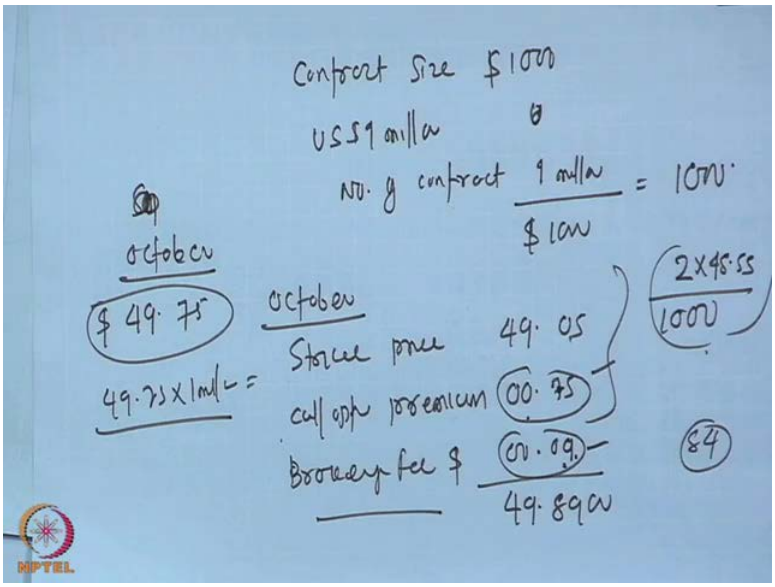
(Refer Slide Time: 50:26)



So, if you calculate that the brokerage fee for dollar per dollar brokerage fee brokerage fee per dollar will be, so how much how to calculate so we need 2 dollar 2 dollar and each dollar price is if you would see the contract which dollar strike price is 48 rupees 48 by 55 and 1 contract size is 1000 dollar, if you divide this per dollar what is a rupee amount will come. The per dollar rupee amount is 00.09 and if you add all these, that is the strike price, call option premium and brokerage fee then you will get what is called 49.89. What is the call options price? The call option, October call option price is 49.89.

Suppose, the you exercise the call option you will per dollar you have to surrender 49 rupees 89 paisa then you will get a per dollar what 1 dollar, but in October month the spot market is how much?

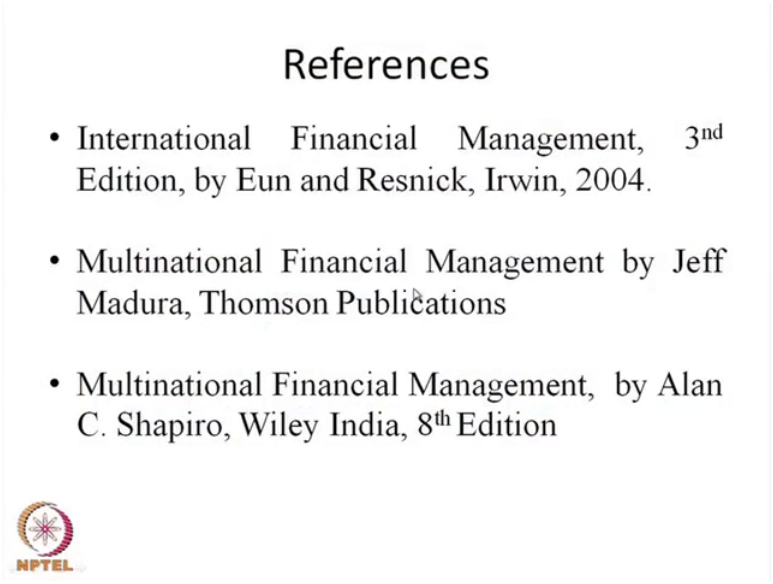
(Refer Slide Time: 52:56)



The spot market in the month of October, when the October month actually arrive, actually arrive we are given a indicative rate the spot market in October month is 49.75, 49.75 per dollar, but he is getting 49.89 per dollar. So, what he is supposed to do? Now, here the position is, is a loss he can close his position he can cancel the contract and purchase that dollar from the market, but he need to pay the brokerage fee and the call option premium these two. So, here you have to estimate what is the per dollar 00.75 00.09 and he is purchasing how many dollar 1 million dollar and you calculate again compare this.

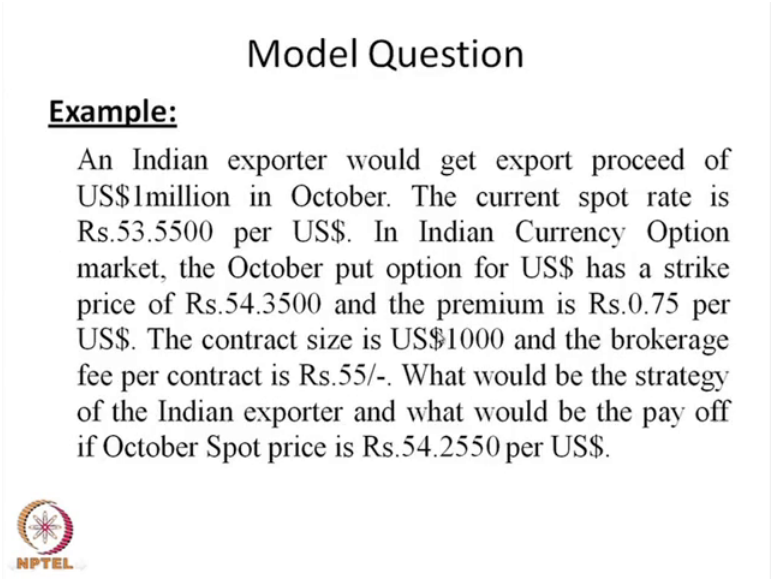
Suppose, he purchase in the spot market 49.75 into 1 million he will get, this is the price, this is the rupee amount for him. If he do not purchase then he have to pay 55 75 paisa, 75 paisa per call premium and also a brokerage fee of 00.09 paisa. So, this together is coming around 84 paisa. 84 paisa per dollar he is losing. So, you have to compare these and see what is the call option profitable or not profitable. If you see in this position it is not profitable to exercise the option, it is profitable to purchase from the spot market.

(Refer Slide Time: 52:59)



Now, this and this is the end of this session and you can see references, these references are as earlier.

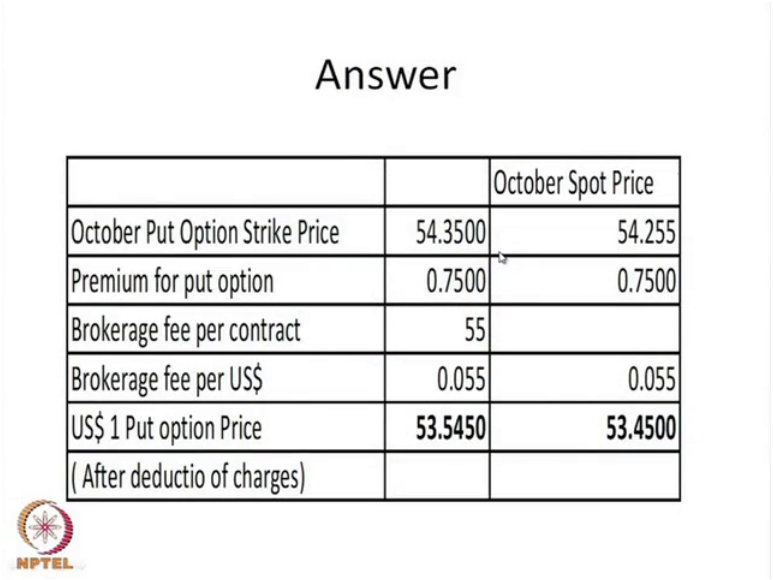
(Refer Slide Time: 53:06)



And we have a one model question for you. The model question is a one exporter side. The exporter would get export proceed after 1 million dollar, the exporter 1 million dollar he will be getting in October, the current spot is running at 53.55, but after current spot is a 53.55, but in the currency options market October put options he is getting US dollar so you have to sell it to purchase a put option. The put option of October month in

the Indian options market is 54.35 and premium per options is 55, 75 paisa per dollar, contract size is 1000 dollar and the brokerage fee per contract is 55 rupees. What will be the strategy from Indian exporter and what will be the pay off if October put premium put option spot market is 54.25, you how to solve the problem. You have to go for October put options strike price is 54.35 you can see that.

(Refer Slide Time: 54:05)



October spot price is 54.25, premium for put option is 75 paisa, brokerage fee per put option is 55. So, if you add this brokerage fee per dollar will be because 55 rupees is per contract, one contract is 1000 dollar. So, divided by 1000 you will get 0.055 together if you add the put option put option per dollar price is 53, if you 54 rupees your strike price, but you are paying this so you have to minus from there. So, a 53.5450 you are getting if you exercise the put option, if you sell your dollar the after one October month you will get 535450, the options seller will give you 53 rupees.

But in the October spot market; the spot market price is 54.25 and since put option you have to pay a premium if any few exercise do not exercise, 75 paisa you have to pay. Similarly, you have to pay the brokerage fee. So, if you in minus this then you are getting 53.45. So, market spot market giving you 53.45 and currency premium currency options market giving you 53.54. What you will do generally, definitely when you have to sell that dollar you have to get more rupees, you exercise at the options here. You will

get 53.54 from the options market and but in spot market you are getting 53.45. So, you are getting a profit by exercising the options put options here.

Thank you.