Commodity Derivatives and Risk Management
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Lecture 05
Futures Contract Market-to-Market Margins

Welcome to this session on Commodity Derivatives and Risk Management. Today's objective is to discuss more on how mark to market margin is calculated, what are commodity's rates and what are commodity options. But before I go to the calculation of mark to market margin, I would like to just refresh what we discussed in last couple of session in terms of in terms of different margins.

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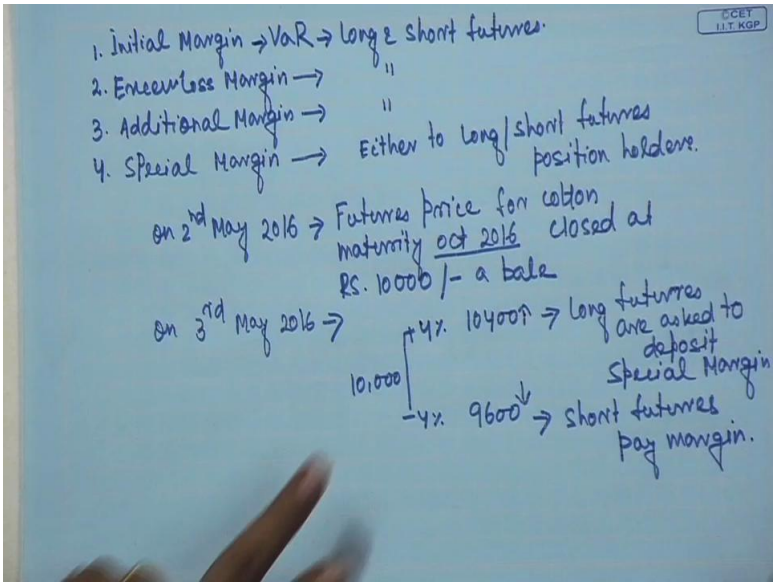

So futures contract requires initial margin to be paid. So this is our we calculate this or exchanges use Value at risk method to calculate the initial margin and this margin is given by both long and short futures holder. Now this is the exchanges also ask for sometimes excess loss margin. Exchanges also ask for additional margin. Exchanges also sometimes levies special margin. Special margin this excess loss margin is asked to both parties. Additional margin is also asked to the both parties, but special margin is asked either long or short futures position holders. Suppose on 2nd May let us say on 2nd May 2016, futures price for let us say cotton, maturing maturity for let us say October 2016, closed at rupees 10 thousand a bale.

Now on 3rd May 2016 if the same futures price that is cotton contract maturing on October 2016 goes to a price label of plus minus 4%, suppose this is 4% and minus 4% that is 10400

and 9600. Suppose futures price goes touches this label then long futures position holder futures are asked to deposit special margin. If futures price touches this label that is 9600 label then short futures holders are asked to pay margin. Now let us go our today's objective of understanding more on mark to market margin. So what is exactly a mark to market margin? So all open position are mark to market. So let us take go back to our example on a cotton producer. What is a fear of the cotton producer?

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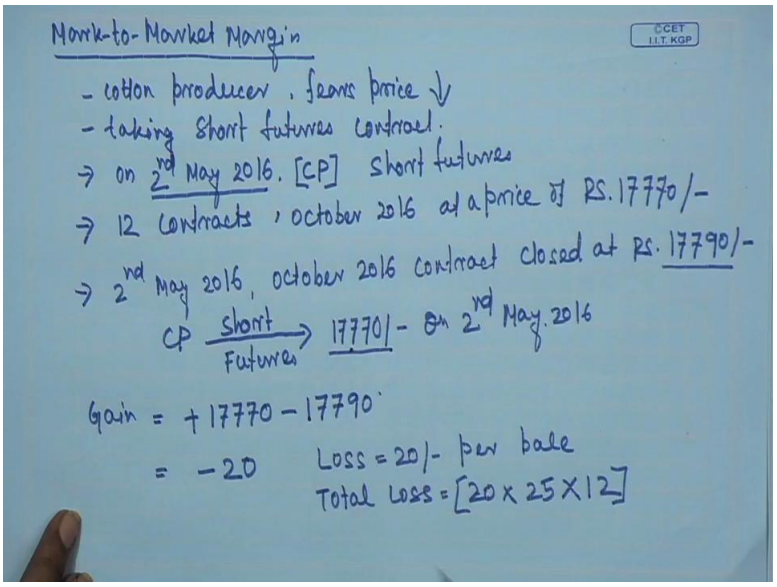

Cotton producer fears price will go down in future. How he will be mitigating this risk, by taking short futures contract. Let us say let us say on 2nd May 2016 cotton future cotton producer let me mm make him as CP cotton producer took short futures for 12 contracts for October 2016 delivery at a price of rupees 17770 per bale. So this is transaction was undertaken at the commodity exchange on 2nd May 2016. Now let us on when the exchange closed on 2nd May 2016, the October 2016 contract closed at let us say rupees 17790. So cotton future sorry cotton producer took short futures at a price of 17770 on 2nd May. Now he agreed to sale when it is short he sold the futures contract at 17770.

Now what option he has in available to him? If he would like to square up this contract on by end of the day that is 2nd May 2016 that means he can do so at a price of 17790. So he sold something at 17770 he can buy the same thing only at 17790. So what is the gain or loss? Gain from this is he will be receiving by selling the futures he will be receiving 17770 and if he squares up his position he will be paying so this means he will be he has a gain of minus 20 or he will incur loss of 20 rupees per bale and total loss will be 20 into 25 bales per contract and 12 contracts.

So this is going to be the total loss for the cotton producer and because he this is the even if it is a notional loss he is going to pay this amount of money to the commodity to the counter party. The cotton producer who has taken a short futures he somebody else must have taken a long futures position so cotton producer will pay this loss to the counter party. As we all know that derivatives are zero sum game so the loss of the cotton producer is going to be the gain of the counter party. So by next day the cotton producer will be that is by next 3rd May 2016 the cotton producer should be paying this amount of money to the counter party. Now let us go to the next day.

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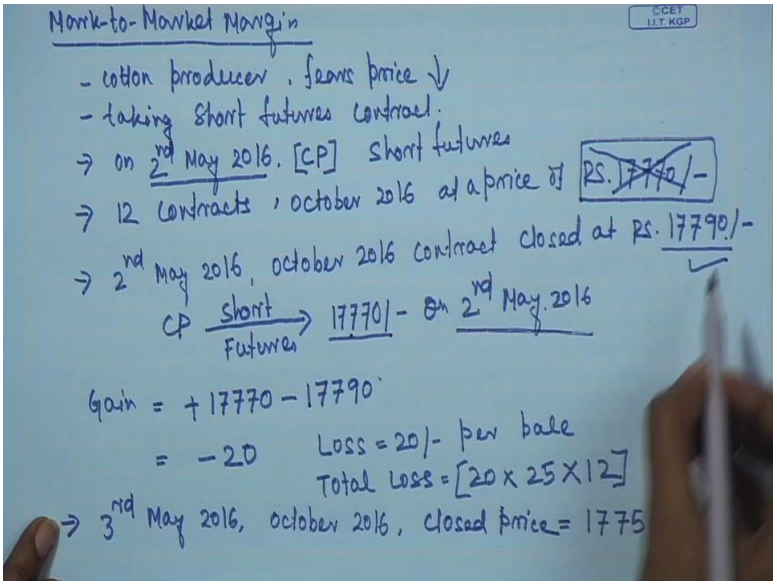

So similarly on 3rd May 2016 the same October 2016 contract futures contract closed at let us say closed price or closing price is let us say 17750. Now the mark to market margin will also be calculated on 3rd May however this initial price has no more relevant for the mark to market margin calculation for the 3rd May. So this is no more relevant. What is relevant is this price. The price prevailing at the day end of the day closing price on 2nd May that is 17790. So same the cotton producer had as if so let us go to our next page. So cotton producer had long sorry short futures at 17790 and 3rd May 2016 October 2016 contract closed at 17750, so exactly the same logic will be applied. He has so agreed to sell something at 17790 and he can buy the same thing at 17750. So what will be his gain or loss?

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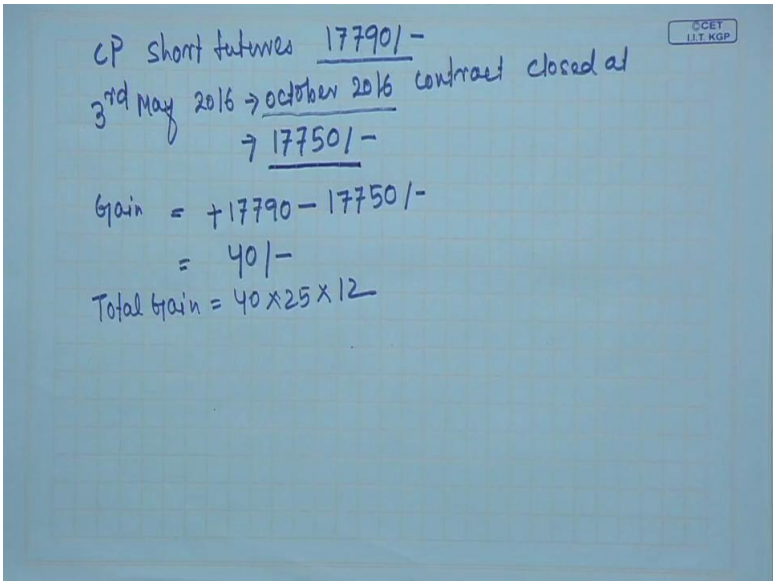

Gain will be he sold something at 17790 and he can buy so that means he has a 40 rupees gain per bale per bale, so total gain will be 40 into 25 into 12. So the same process will go on till this cotton producer squares up his position. If he does not square up position till October 2016 contract comes to an end then it will lead to a delivery. This party will deliver the underlying whoever is the counter party will take delivery of the underlying that is a cotton contract. Now let us go back to excel calculation which I have done. Let us as I mentioned mark to market margin all open positions are mark to market on daily basis till a party squares up its position. so let us go to this excel file. Exactly same thing I have mentioned here.

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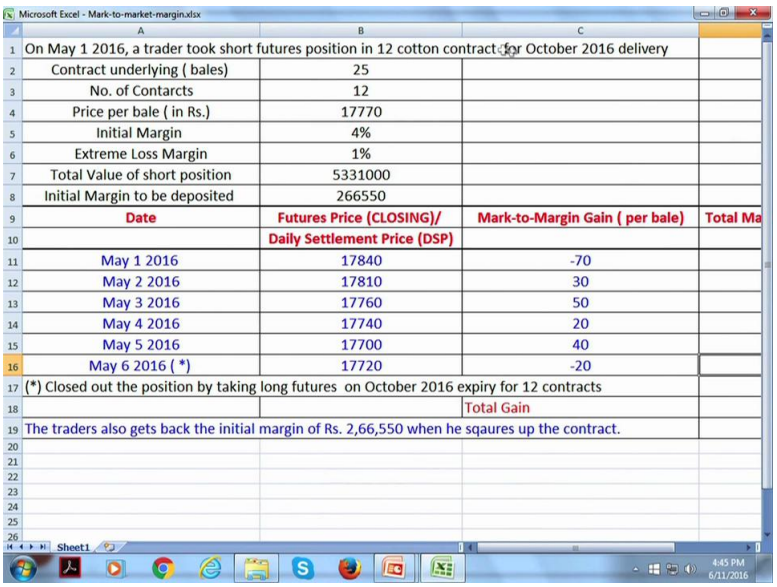

Microsoft Excel - Mark-to-market-margin.xlsx

	A	B	C	
1	On May 1 2016, a trader took short futures position in 12 cotton contract for October 2016 delivery			
2	Contract underlying (bales)	25		
3	No. of Contarcts	12		
4	Price per bale (in Rs.)	17770		
5	Initial Margin	4%		
6	Extreme Loss Margin	1%		
7	Total Value of short position	5331000		
8	Initial Margin to be deposited	266550		
9	Date	Futures Price (CLOSING)/	Mark-to-Margin Gain (per bale)	Total Ma
10		Daily Settlement Price (DSP)		
11	May 1 2016	17840	-70	
12	May 2 2016	17810	30	
13	May 3 2016	17760	50	
14	May 4 2016	17740	20	
15	May 5 2016	17700	40	
16	May 6 2016 (*)	17720	-20	
17	(*) Closed out the position by taking long futures on October 2016 expiry for 12 contracts			
18			Total Gain	
19	The traders also gets back the initial margin of Rs. 2,66,550 when he sqaures up the contract.			

Sheet1

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Here May it 1 2016 a trader took short futures position on 12 contract for October 16th delivery. Contract underlying is 25 bales, number of contracts is 12, price per bale at which the party took short futures position that is 17770. Initial margin and extreme loss margin is 5% so total value of the short position is 5lakh 5331000, and how much margin to be deposited? Margin to be deposited is 5% of this value is going to be the total margin deposit. Now let us go to so by end of the May 1st the cotton contract for October delivery closed at 17840, so that leads to a mark to market gain of minus 70 means mark to market loss of 70 rupees. So total mark to market total mark to market margin gain is minus 21000 so that means this cotton producer is going to give 21000 to the counter party.

Similarly lets say on May 2nd this contract closed at 780. 17 17810 so when we are comparing this price because 17770 will no more be relevant. So when we are comparing this price 17810 with 17840, this cotton producer has now 30 rupees gain, so he will be getting 9000 from the counter party. So this process goes on till this cotton producer squares up the position. Suppose on May 16 2016 the cotton producer cotton producer squared up squared up its position, so if we sum all this all this total mark to market gain or loss so he has gained 15000 rupees on all these 12 contracts and the day he squares up his position he gets back this cotton producer gets back this initial margin of 266550 rupees what he had deposited.

So this is an example of how mark to market margin is calculated and one thing I would like to say here is that the cotton producer has this is in mark to market margin calculation for only 1 contract. Let us say the cotton producer had taken a short futures contract in October 2016 contract as well as a short futures contract in November 2016 contract. So the mark to market margin calculation will be done separately for both to both of these contracts. As if whatever the prevailing closing price for October 2016 contract will be used to calculate the mark to market price for October contract. Similarly on 1st May 2nd May 3rd May the closing price of November 2016 futures contract will be used to calculate the mark to market margin for the same cotton producer.

And the exchange will ask the cotton producer to deposit the mark to market margin for both contracts if the trader has open position for both contracts. This brings brigs an end to our discussion on mark to market margin. And here I would like to discuss little more on how the closing price or settlement price is calculated by the exchanges.

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So this is very important because the daily settlement and closing is pp is the price based on which the mark to market margin is calculated, so daily settlement price is not the last trading price. Daily settlement price is the weighted average price of futures contract traded during a specific time period during the close of the trading for a given day. So it is not the one price only, it is a weighted average price of some half an hour half an hour trade. So whatever futures contract traded at during the half last half an hour of the trading period that is the weighted average of that is taken as a daily closing price or settlement price. Now let us go back to what happens when the contract comes to an end?

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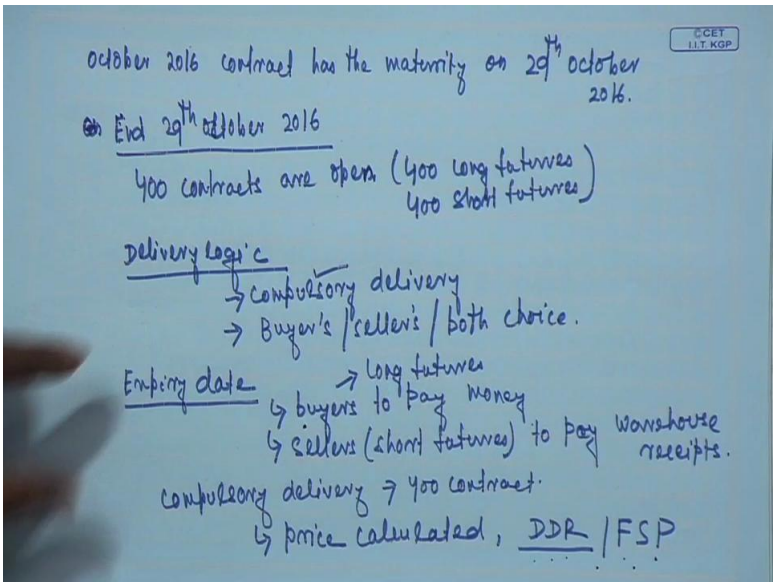

Let us say October same cotton contract October 2016 contract has a maturity on 29th October 2016. Let us say on end of this date on by end of 29th October 2016 some 400 contracts are open. So that means 400 long position 400 long futures as well as 400 short futures are. If you recall I had when I was discussing the contract part, we discussed about the delivery logic. For a cotton contract the delivery logic was compulsory delivery. So let us first spend some time in understanding what are the different types of delivery logic can happen. So you have a delivery logic, you can have compulsory delivery, you have buyer's or seller's or both choice. Let us understand if 400 contracts are open on the last day contract expiry date lets what will happen in the compulsory delivery.

So in the compulsory delivery means the buyers have to take delivery and sellers have to deliver the underlying. Underlying means sellers have to deliver the warehouse receipt. Now so in this case so on expiry plus expiry date the buyers have to buyers have to pay money and buyers means long futures position holders and sellers means short future sellers short futures position to pay warehouse receipts. So because it is compulsory delivery for compulsory delivery warehouse receipts are for 400 contracts will be given by the sellers. Now what is the amount of money will be paid by the buyers? The buyers will be paying the price calculated by the exchange on the last day of the contract maturity that it is the price prevailing on the 29th October.

So which price they will take? We if you recall we had we had discussed something called a due date rate DDR. Due date rate or final settlement price because on 29th October 2016 we will not have any futures contract. So what we will have is the only spot price. But which spot price to be considered? So exchanges normally identify or they take a poll and from different market players they collect spot prices and based on some averaging they find out what is the due date rate or final settlement price, so that final settlement price is paid by the buyers and anyway sellers deliver the warehouse receipts of the four 400 contracts.

Now let us go understand little bit on what will happen if the delivery logic is not compulsory delivery, it is it could be buyers choice or seller choice or both choice. Let us go to what will happen if the delivery logic is buyer's choice. So we have open position for open positions open position for 400 contracts. Let us say delivery logic I am using the word DL, delivery logic is buyers choice.

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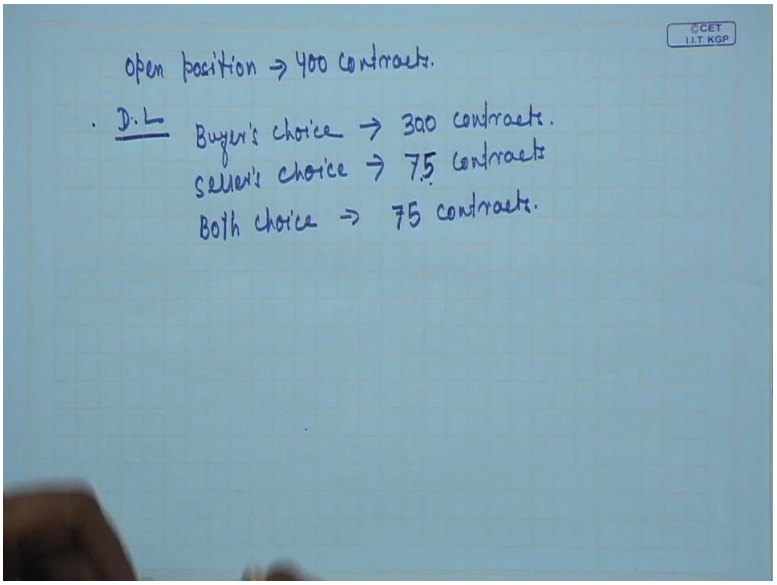

If buyer's choice is there and buyers give a indication to the exchange that they would like to take delivery of cotton for worth of 300 contracts, the sellers have no choice in this case. The sellers have to provide warehouse receipts for 300 contracts and remaining 100 contracts of the cotton will be will be settled through cash. So that will be the payment will be made based on the final settlement price. If delivery logic is seller's choice suppose sellers give an indication that they would like to deliver only 75 contracts underlying for 75 contracts. So the sellers will be now so sellers will be delivering now warehouse receipt for 75 contracts and rest 325 contracts will be settled through cash.

And if it is both choice, buyer's as well as seller's so the lowest of both buyer's and seller's will be giving their choice to the exchange and depending upon whichever is the lowest then that that amount that amount of warehouse receipt will be given to the exchange and remaining will be will be settled through the cash. So in this case if buyer's give 300 contract and seller's give 300 contract so both choice will lead to 700 contracts to be delivered and rest 425 to be settled through the cash. Now let us go to this particular slide.

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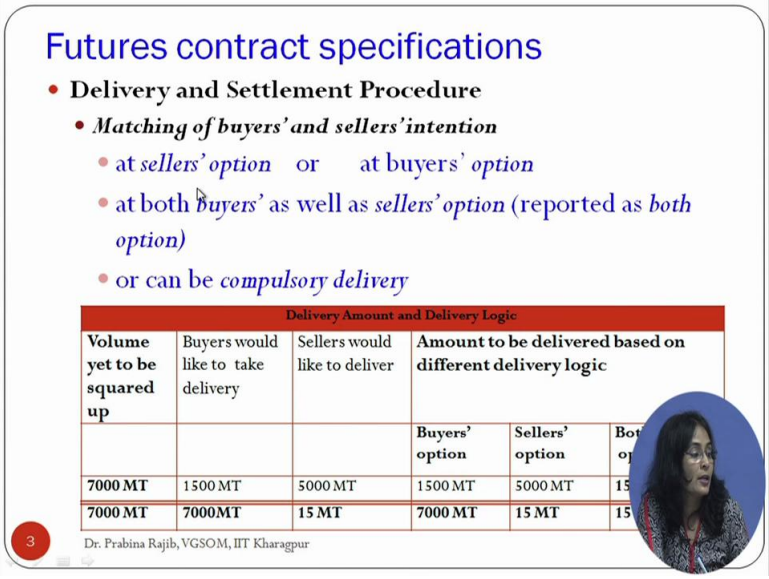

This particular slide shows how order matching will happen if depending upon the delivery logic. So this particular slide is self-explanatory, I am not going into much detail you can spend some time understanding this details which is mentioned here. I have also mentioned how the due date rate is calculated.

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Due date rate calculation or final settlement price DDR or FSP is the price at which traders with open positions settle the trades after the expiry. It is normally the average spot price of the underlying asset at some major spot markets over some days and each exchange very categorically mentions how they will calculate the due date rate or final settlement price. if you recollect the contract specification document which I had shown it to you all the 8 page

PDF document from multi commodity exchange very categorically explains how DDR will be calculated for the cotton, from which market they will collect how what mechanism will be used. Now let us say do really a traders use the exchange platform for taking delivery or giving delivery?

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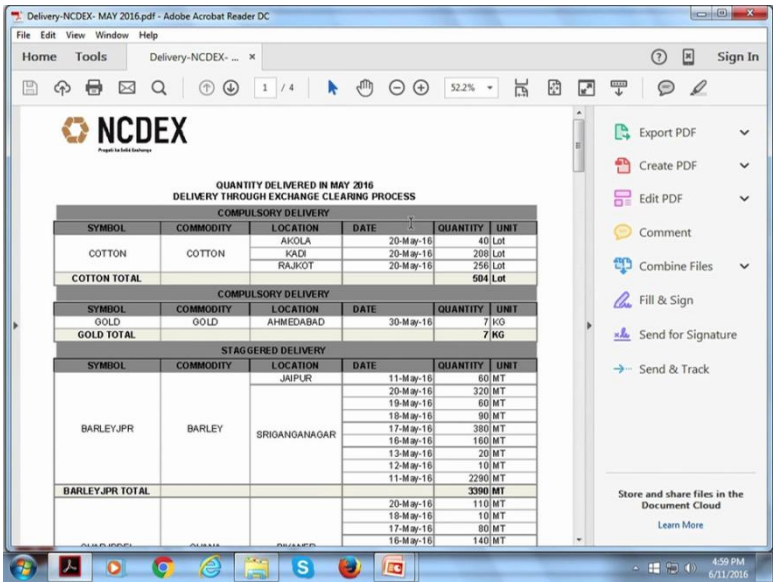

This particular link so this particular link if you can see this one I have downloaded from NCDEX website. This source for the month of May 2016 the amount of quantity delivered through the exchange clearing process. So you have different commodities and the total amount of different commodities which have been delivered by buyers and sellers through the exchange platform. So this is something interesting I thought of sharing. So you have a sugar, medium sugar of whatever has been the total amount of delivery has been 10790 metric ton. So different commodities have different commodities amounts are total given. So this indicates the amount of delivery which buyers and sellers have done in the exchange platform.

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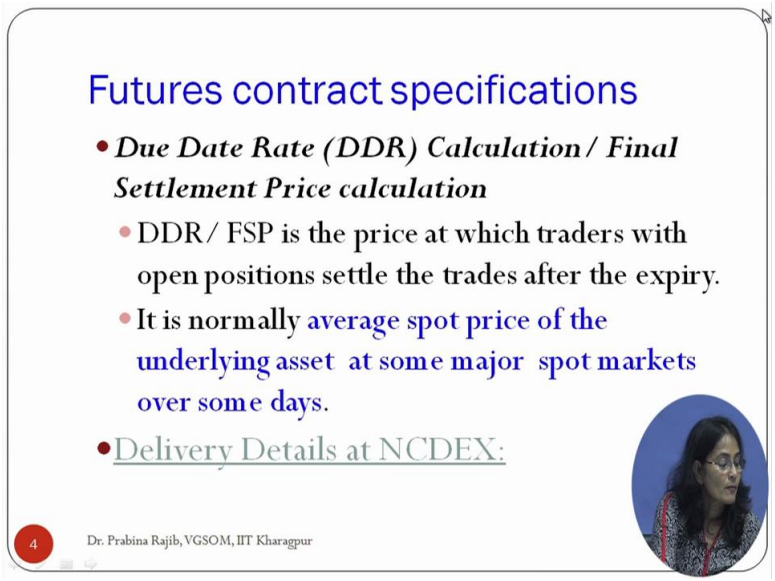

Now I will just I have also in the previous slide previous sessions I have explained what is a delivery pay in out delivery pay in delivery pay in date, pay in date for funds, pay delivery pay out date, pay out that will be pay out date for funds. So this is now just as a as a snapshot I would like to show you something.

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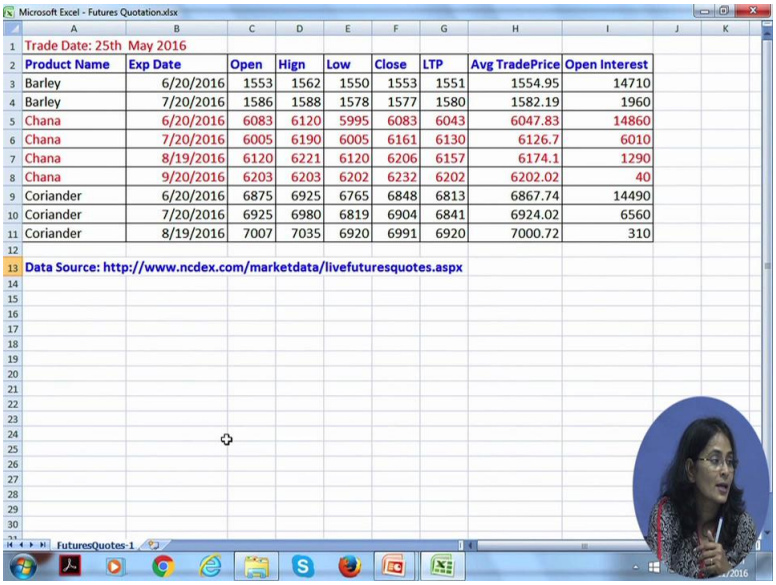

Product Name	Exp Date	Open	Hign	Low	Close	LTP	Avg TradePrice	Open Interest
Barley	6/20/2016	1553	1562	1550	1553	1551	1554.95	14710
Barley	7/20/2016	1586	1588	1578	1577	1580	1582.19	1960
Chana	6/20/2016	6083	6120	5995	6083	6043	6047.83	14860
Chana	7/20/2016	6005	6190	6005	6161	6130	6126.7	6010
Chana	8/19/2016	6120	6221	6120	6206	6157	6174.1	1290
Chana	9/20/2016	6203	6203	6202	6232	6202	6202.02	40
Coriander	6/20/2016	6875	6925	6765	6848	6813	6867.74	14490
Coriander	7/20/2016	6925	6980	6819	6904	6841	6924.02	6560
Coriander	8/19/2016	7007	7035	6920	6991	6920	7000.72	310

This is again I have downloaded from the NCDEX website, which on which date trade date is 25th May 2016. what are the commodities? This is barley, 2 commodities for barley, 4 commodities for Chana and 3 commodities for Coriander. It has nothing to I mean there are many more commodities available; I have just taken a snapshot. So you have a let us say go back to chana contract. Trade date is 25th May, but the contract matures on 20 20th of June.

This contract matures on 20th of July, this contract matures on 19th of August, and this is 20th of September. So the when exchange opened the futures contract the first contract to be executed first buy and sell order to match is at 6083 rupees.

Day high, day low, day close and day this is LTP. This is what I would like to want each of you to focus that is your that is your even if the close price is 6083, but the LTP is a sorry if the last traded price is 6043 but the close price has been calculated as 6083. So this is the price for this price will be close price will be used to calculate daily mark to market margin not the last traded price.

Last traded price is the last one trade which has been executed at the exchange platform. But the close price is the average price of average trades happening within half an hour of closing. Similarly you have LTP of 6130 for chana that is July contract, but close is 6160. Similarly if you can you can see that the LTP is different than the close price and this close price is used to calculate the mark to market margin on daily basis. So this brings an end to our discussion for this session, so we will continue with the remaining part of futures discussion in the next session, Thank you all of you.