Commodity Derivatives and Risk Management
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Week-02
Lecture 10
Futures Contract (Mark-to-Market/ MTM Margin)

Welcome to the 10th lecture session on Commodity Derivatives and Risk Management. And today we are going to discuss Mark to Market Margin or popularly it is known as MTM margin. In the previous session we discussed initial margin calculation and also, we know that both long futures position holder as well as short futures position holder will be giving the mark to giving the daily margin to the clearing house. Now let us take an example to understand the process of depositing initial margin and the process of daily mark to market margin. It is also very important to understand that the daily mark to market margin is the most important aspect of a futures contract. Now what do we mean by daily mark to market margin? All open positions will be marked to the market at the daily settlement price or the closing price.

And the party which is incurring a loss because of the futures contract that party will pay money to the other counterparty. Now let us take a real-life example. Let us say during October 2022 a turmeric farmer Mr. T fears that the price will go down by the time in the month of April, it produces turmeric, the turmeric price will go down. And it wants to mitigate the risk by entering into one short futures contract.

And let us say the futures price at which the contract got executed at NCDEX platform that is 7484 rupees a quintal. And this particular trade was undertaken on 3rd October 2022 for expiry of 18 April 2023 contract. And this particular farmer also wants to deliver turmeric of basis quality at an exchange approved basis delivery location. Basically, the farmer wants to deliver turmeric to the exchange approved warehouses. Now as soon as the Mr. T the turmeric farmers trade gets executed there has to be somebody who has taken a long future. Mr. T has taken short futures and Mr. X will take let us say the long futures contract. And the exchange at 1045 am in the in the morning on 3rd October 2022 the trade got executed.

And as soon as the trade gets executed both parties will be depositing the initial margin. And let us say the exchange has informed the applicable initial margin to be 13.5 percent. So, both Mr. T and the counterparty will be depositing 50,517 rupees to the clearing house associated with the exchange. So, this is the initial margin part of it. Now, let us go to the mark to market margin concept. And as the name suggests, the daily mark to market margin is calculated on a daily basis. And Mr. T has taken short futures contract.

And as we as I mentioned that Mr. T has taken short futures contract at 7000 7484 rupees per quintal. Now, on 3rd October at the end of the day, the exchange will calculate and report the daily closing price. And or daily settlement price in the last two last session, we have discussed the process of calculation of daily closing price or daily settlement price. Let us say that day on 3rd October daily settlement price is coming to 7394.

Now, the open position of all those people who have long futures position as well as short futures position will be mark to market with this price of 7394. Now, Mr. T has taken the short futures position that means he had agreed to sell the underlying at 7484. Now, if he wants to square up this position, he will be able to do so by entering into a long futures contract or by the contract at 7394. Hence by the daily mark to market margin he is benefiting by 90 rupees on the closure of 3rd October 2022.

So, the process of mark to market margin has been calculated here that is 7484 minus 7394 is your 90 rupees per quintal. So, if Mr. T is benefiting whoever is the counterparty let us say Mr. X in this case Mr. X will be paying 90 rupees a quintal to Mr. T within 2 days of 3rd October 2022. So, basically Mr. X will pay 90 rupees to Mr. T. Similarly, the next day then buyers and sellers will be entering into different kinds of a different futures contract let us say by 4th October the same turmeric futures expiring on 18th April closes at 7758. So, again all those traders who have long futures position as well as short futures position their position will be mark to market. And as you can see by 4th October 2022 Mr. T will be incurring a loss of 364 rupees a quintile. So, that means, Mr. T is going to give 364 rupees to the clearing house and the clearing house in turn will pay those 360 rupees a quintal to the counterparty. So, this process will go on till Mr. T closes his position or the contract comes to expiry on 18th April 2023.

As we have mentioned that Mr. T would like to deliver turmeric on contract expiry date at a basis center. So, if that is so, let us find out how this you know the settlement will happen on the expiry date. As you can see this particular table shows the different amount of daily mark to market margin to be given by Mr. T or to will receive from the counter party.

So, any figure having a negative value that means, Mr. T will pay this amount any figure having a positive value means Mr. T will receive this amount from the counterparty. So, let us say from 3rd October to 18th April this is how the closing price will be moving. Because of the paucity of the space, I am not able to show the full Excel calculation, but this Excel calculation detail calculation will be available for those who would be seeing these videos through the NPTEL platform at a later point in time.

So, now let us say that during this start from the start of the contract, that is 3rd October 2022 till the contract expiry someday Mr. T will receive money someday it will Mr. T will pay money. And if you see some total of total daily mark-to-market margin is positive 726 rupees that means, over this period of time Mr. T will receive 720 rupees from various counterparties.

Now 6758 is nothing but the final settlement price. Please note that by 18th April 2023, futures contract will come to an end and there will be no future price. And this 6758 is the final settlement price which is nothing but the average of the pulled spot prices. So, what that indicates that on 18th April 2023 Mr. T will transfer the warehouse receipt to the clearing house as you can see in this particular diagram.

Mr. T will transfer the warehouse receipt to the clearing house, clearing house in turn will receive the transfer of warehouse receipt to any trader whoever is having a long position. And that long-position party will pay the final settlement price to the clearing house and clearing house in turn will transfer that final settlement price to Mr. T. Now if this 6758 is the final settlement price that means, Mr. T will be delivering one quintal of turmeric at 6758, will receive 6758 from the counterparty and in the meantime, he has also benefited or earned 726 rupees as daily mark-to-market margin. So, cumulatively these two numbers will result in as if he is selling one quintal of turmeric at 7484.

Now, let us go to the other situation. Another situation is where the future price closed at a much higher value than 7484. In the previous example the future price or the final settlement price was lesser than 7484 in this case the final settlement price is 8000 which is much more than the 7484. So, as you can see this particular table shows the daily mark-to-market margin to be received or paid by Mr. T. And as you can see it is negative of 516 that means, cumulatively during this period of time Mr. T will be paying 516 rupees a quintal as daily mark to market margin. And the same process will happen Mr. T will transfer the warehouse receipt to the counterparty and counterparty is going to give Mr. T 8000 rupees. So, that means, Mr. T will be selling turmeric at 8000 rupees and in the process of mark to market margin, he has paid 516 rupees. So, the net receipt is going to be 7484 rupees. So, to summarize, if Mr. T's fear comes true that is turmeric price falls, he will receive lesser FSP that is your final settlement price and gain mark to market margin. If Mr. T's fear was unwarranted turmeric prices actually increase from October to April, he will receive a higher final settlement price, but lose mark to market margin. In any case, Mr. T would receive 7480 rupees a quintal through futures contract devotes of any counterparty risk. And here I would like to draw your attention to the fact that Mr. T could have entered into a short forward contract with a counterparty on 3rd October 2022 at 7484.

If the counterparty would not have defaulted Mr. T would have delivered the turmeric and would have received 7484, but as we know forward contracts can have a counterparty risk. So, to avoid that risk one can come to the exchange platform and be sure of receiving the negotiated price. And now let us come back to our discussion on initial margin please recall on 18th sorry on 2nd October 2022 Mr. T had deposited the initial margin and whoever was the counterparty to Mr. T in this case Mr. X had also deposited the initial margin. As both parties have performed their duty the contract has come to an end smoothly after this expiry period clearing house will return the initial margin to both parties. Please note that initial margin is akin to a caution money see whenever we rent an apartment many a times the landlord asks us to deposit some amount of advance money and what is the reason behind it that if we do not do any on toward activity or break some house fixtures then the landlord returns us the full amount of the deposit. Similarly, students are also asked to deposit caution money in colleges or universities when they take admission. So, initial margin is nothing, but a caution money if long futures position holder and short futures position holder abide by whatever they are supposed to pay to the exchange or exchange clearing house they get back the initial margin without any difficulty after the end of the expiry.

So, this is how the futures contract daily mark to market margin is calculated and paid and received by long futures position holder and short futures position holders. Now, coming back to this particular slide indicates different kinds of different amounts of delivery to have happened in two of the premier exchanges in India. So, I have just taken the turmeric contract details from the NCDEX clearing corporation's website. So, the first block shows by April 2023 about different short futures position holders have delivered commodity that is the pay in quantity and different long futures position holder have taken this commodity or which is known as your payout pay out quantity from the exchange clearing house point of view. And you can see the sum total of pay in quantity has to be equal to the sum total of payout quantity.

And the second block in this case shows the different kinds of underlying being delivered at MCX platform, MCX clearing Corporation of India Limited. So, MCX CCL and this is on all commodities delivered in delivered at MCX CCL platform for April 2023 contract. Again, this is not the full list. I have just taken a snapshot of some of the commodities as you can see on 20th April the exchange has delivered or short futures position holder have delivered about 1184 kgs of silver. Similarly, different in other days you have different amount of underlying commodity is mentioned and also the location the specific location warehouse location where these commodities have been delivered. Now, let us discuss another interesting aspect of how the daily margin mark to market margin and expiry day settlement happens when the contract is not a compulsorily delivered contract, but contract is a cash settlement. With respect to daily mark to market margin the and initial margin there is no difference. What is the difference in the case of a cash

settlement? Please note that on the contract expiry date there will be no warehouse receipt to be given by the short futures holder. So, short futures will not be delivering the underlying warehouse receipt. Only in this case 22 rupees per quintal will be given by long futures holder to the short futures holder on the expiry date which is your 18th April only the daily mark to market margin will be paid or received. And why am I mentioning that 22 rupees per quintal will be given by long futures holder to the to the short futures holder because this is a positive value and this particular daily mark to market margin has been calculated from the short futures position holder point of view.

So, because this is positive so, the long futures position holder will pay 22 rupees a quintal to the short futures position holder. Now, if the short futures position holder is not delivering the underlying that means, the short futures position holder is free to sell the underlying turmeric in the open market. And please note that as the FSP is calculated from the spot price the final settlement price of 6758 in this case this is calculated from the spot price, it is expected that the spot futures position holder will receive a price which is near to the FSP if not exactly the FSP price in the local Mandi or the local market. So, the overall total margin the short futures position holder will receive will be 726 rupees and he will be selling turmeric at 6758 rupees. And this will be same as if the short futures position holder is selling the underlying at 7484 rupees which was initially agreed upon or initially transacted on 2nd October 2022.

Now, go to the reverse case, again the same mark-to-market margin process will go on on the contract maturity date that is the expiry date the daily mark to market margin is 60 rupees that means, only 60 rupees per quintal will be given by the short futures holder to the long futures holder. Here the situation has changed compared to the previous case. In the previous case that margin was positive 22 rupees. So, that is the reason why the long futures position holder was paying money to the short futures position holder. In this case it is negative so that means, the short futures position holder will be paying 60 rupees a quintal to the long futures position holder on the expiry date.

And no warehouse receipt will be given by the short futures holder because this contract is settled through cash with the understanding that the short futures holder is free to sell the underlying in the open market. And the price it will receive by selling the underlying will be very close to the 8000 rupees of final settlement price because as we have discussed earlier the final settlement price is nothing but an average of the pulled spot prices. And please note that during this whole process overall margin payment by the short futures position will be 516 rupees because this sum total is the negative of 516. And it will be receiving 8000 rupees for selling turmeric one quintal of turmeric and it will be paying 516 rupees as mark to market margin overall making a or overall selling turmeric per quintal at 7484. So, what is the key essence or key takeaway from this particular discussion is that whether the long futures position holder or short futures position holder, they delivered through the exchange or they delivered or the contract is

cash-settled, they will be getting the price negotiated on the contract start date if they are waiting for the contract to expire and to receive the final settlement price.

So, this is the one of the most important understanding of the futures contract and how the futures contract daily settlement and mark to market margin work. Now, coming to the next important aspect, is exchange delivery compulsory? Even if a contract is compulsorily deliverable, does it require the turmeric farmer to deliver the turmeric in exchange approved warehouse. The answer is not a turmeric farmer may produce some turmeric which may be different quality of variety than exchanged approved quality and variety. So, even if a farmer wants to deliver turmeric through the exchanged approved warehouses it will not be able to do so, if the quality of its turmeric produce is different than what exchange has mentioned. And many a times the farmer may be located at a place which may be far from delivery center or additional delivery center making it difficult for the farmer to not go for delivering in the in the exchange approved warehouse.

Without delivering the underlying the farmer can still hedge the price risk by taking short futures contract, but closing the contract or squaring of its position before the contract enters into a tender period. Similarly, a buyer of a turmeric who is fearing that the price will go up at a later point in time can come to the exchange platform only to hedge the price risk and not to take delivery the buyer can decide to buy turmeric from any market of his or her choice. So, with this we will end today's session that is like session number 10. And in the next session we will be discussing more about who is a hedger, who is a speculator and other aspects related to the futures contract. And I always look forward to interacting with all of you in the next session and. Thank you all of you.