Commodity Derivatives and Risk Management
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Week-01
Lecture 03
Commodity Spot Market & Different types of Auctions

Welcome to the third lecture on Commodity Derivative and Risk Management. In the second lecture we were discussing the commodity spot market and different types of auction methodology used in this commodity spot market. And this lecture is a continuation of the previous lecture. Just to refresh, we started with discussing different types of auctions employed in the spot market. So, we discussed forward auction, we had discussed reverse auction, and we also discussed when the seller or buyer is interested to buy or sell a single unit or a multiple unit. In the previous session we had in detail discussed about this English auction, Dutch auction, first price sealed bid auction, second price sealed bid auction.

However, we had not discussed in greater detail Swiss challenge auction. We also discussed single or uniform price auctions when the seller is interested to sell many units or multiple units. And we will continue from the discussion where the seller is interested to sell many uniform units and is interested to use a multiple-price auction. And just to refresh, this particular slide indicates how a seller will arrive at the price of 340, when the different buyers are bided at different units at different prices.

And in the previous session, we discussed the price and the process through which the seller will be able to arrive at a uniform price of 340 and how the seller will be able to identify how many units it will be selling to which buyer or bidder. And as we have discussed that different buyers will be getting different units, but every buyer will pay the same uniform price of 340 rupees. Now let us move to the next part, next type of auction that is when the seller is interested to sell multi units it is a forward auction, but it will not be a uniform price auction, but it will be a multiple price auction. So, the same process seller is interested to sell 1000 lumber pieces which are uniform in shape and size, and it solicits bids from different buyers and different buyers are given different prices at and the number of units they are interested to buy at that price. And here what the seller will do is start selling the units from the highest price bidder.

So, who is the highest price bidder? Buyer C has bided 400 rupees and wants to buy 150 units. So, what the seller will do is sell 150 units to buyer C at a price of 400. So, now the seller has 850 units to sell because it initially wanted to sell 8000 units. Similarly, the next highest bidder who is the buyer A who has bided 375 rupees per unit and wants to buy 500 units. So, the seller will deliver 500 units of these wooden boards to buyer A and collect 500 into 375 rupees.

And similarly, buyer D will collect 360 rupees and deliver 300 units of these lumber boards. And finally, please note that buyer B will be able to only buy 50 units at a price of 340 rupees and so that the seller ends up selling 1000 units. So, you can see the seller is selling 1000 units, it is selling the units to same these 4 buyers that is your A, B, C, and D buyers, but the price it is collecting from different buyers is different in case of a multiple price auction as compared to the uniform price auction. Exactly similar processes, but in a different manner will be done in case of a reverse auction. So, reverse auction as we I have already mentioned reverse auction is always initiated by the buyer who has many uniform units to buy, and the buyer can initiate the process where it agrees to pay a uniform price to buy the goods, or it agrees to pay a different price to buy the different units.

So, the process remains the same as we have discussed in the previous cases. And the buyer will be able to buy the desired unit by paying the same price or paying different prices to different sellers. Now, there is another very interesting kind of an auction which is being currently undertaken by Indian banks though not in a commodity market per se. This auction is known as a Swiss challenge auction and here this is an example of a Swiss challenge auction when the auctioneer or seller or buyer wants to buy or sell one unit. So, it can be a forward auction as well as reverse auction.

So, let me explain in detail how the forward auction works. So, the seller initiates the auction and solicits bids from the buyer for the item it wants to sell. Using the first price sealed bid auction mechanism which we have already discussed, the seller identifies the buyer basically the highest bidder who is willing to buy the underlying item at the highest price that becomes the chosen one. Now, let us say company A is the highest bidder with INR X rupees as the bid price which is the highest price. Now, once this process is over, the seller or the auctioneer makes this information public and invites a second round of bid.

Let us say another company B codes a price higher than INR X that is company B is interested to buy the item from the auctioneer or the seller at a price higher than X rupees. Let us say at Y rupees then the seller asks the original bidder that is company A to match the INR Y. And if company A is willing to pay a high price of Y rupees, then the auctioneer delivers the goods to company A and collects Y rupees otherwise the auctioneer sells the good to the company B and collects Y rupees. So, this is an example of a Swiss challenge forward auction, exactly in case of a reverse auction the same thing is done, but in a little different manner instead of identifying the highest bidder in case of a reverse auction the buyer using a first price still bid auction identify if the seller which is the lowest bidder or L 1. And again this bid is made public and if any other bidder who is willing to pay a price which is lower than originally quoted by the first bidder then the company buys from the second bidder otherwise the company buys from the original bidder.

Also there is another type of auction which is your known as your double auction in case of a double auction both buyers and sellers give buy and sell prices as well as buy and sell quantity. Please note that all these different types of auction we discussed till now involves either the buyer initiating the auction or the seller initiating the auction, but in case of a double auction, both buyers and sellers give both the buy price as well as sell price, buy quantity and sell quantity, when a buyers bid price and the seller asking price match, the trade is completed at that price. And trade matching can happen on a continuous basis and or trade matching can happen on periodic interval. So, today at this point in time I am not giving any numerical example related to the double auction because as we go forward, we will be discussing this double auction concept in greater detail in the electricity spot market and in electricity derivative market. So, till such a time we will not be discussing in detail related to how exactly the price match and quantity match happens.

Now coming back to where we started recall in the second session, we discussed that for Food Corporation of India, through its open market sell scheme, once it initiates the process and wants to sell wheat to different buyers, different bulk consumers. Now, on what basis Food Corporation of India decides to whom it will sell wheat, the Food Corporation of India basically follows a multiple unit's multiple price auction mechanism, and it accepts the bid on price time and quantity priority. So, the detail which you can see, it is a snapshot that I have taken for from the Food Corporation of India website, the pdf link is also given. So, if you can see how the Food Corporation of India accepts the bid. So, a bidder who has bided the highest price, that particular bidder is given the precedence, and that bidder is able to buy the quantity of whatever he or she has bided.

Similarly, if two bidders have quoted the same price. So, the bidder which has quoted the same price at the earliest gets the preference. So, the first preference is price preference and if two bidders have quoted the same price, the bidder which has quoted the price at the earliest will be given priority. If two bidders have quoted the same price exactly at the same time and please recall that this auction mechanism is done online. So, if two bidders have quoted the same price and at the same time the bidder which have quoted the highest quantity, the higher quantity will be given priority.

So, Food Corporation of India uses this mechanism which is a basically a forward auction multiple price multiple unit auction and it uses the price, time, and quantity priority to sell wheat. So, to summarize commodity spot market is a market that is very diverse, very dispersed which is unlike a spot market for a financial instrument. Please note that if I want to buy a Infosys share or I want to enter into a futures or option contract on Infosys, I can do so at either Bombay Stock Exchange or National Stock Exchange. But if somebody wants to buy wheat, they have to go to a mandi or they have to go to Food Corporation of India to buy this wheat in the spot market. If they want to enter into derivative contracts on wheat, they probably have to come to the National Commodity Derivative Exchange.

So, what I would like to draw your attention is that, in case of financial markets, both the spot market and the derivative market operates at a same location or a same platform. However, in the case of a commodity market, the spot market operates at a completely different rate as compared to the derivative market. And when we talk about commodity spot prices, we normally talk about the wholesale price. Please recall that when we started session 2, I said that somebody buying 2 kgs of potato from a friendly neighborhood shop is also an example of a spot market transaction. But we do not quote that price as the spot price for potatoes, if somebody is saying that what is the spot price for the potato, somebody would probably be quoting the potato price from a major wholesale market.

And this spot price in this wholesale market is predominantly arrived through auction processes. And in the previous session and this session we discussed some of the auction processes as utilized by the commodity spot market and some other market also these different types of auctions are used. Also, another very interesting aspect of commodity spot price is that commodity spot prices vary on a day to day basis not because of the supply demand, but also because due to the quality of commodity being traded. Let us say today's Infosys price is let us say 1800 rupees and tomorrow it goes up to 1820 rupees. A great deal of that will be because of the supply demand issue, maybe more people are interested to buy Infosys sale.

But in case of a let us say commodity if price has gone down today compared to yesterday not because you know all of a sudden, the supply has gone down or demand has gone up, but because maybe the kind of potato which is coming to the local market has you know little less compared to the yesterday's lot. So, commodity spot price the variation in commodity spot prices is not only because of the supply demand factors, but also could be due to the quality variation part. Now why are we discussing so much about the spot market? Please note that any derivative contract derives its value from the underlying spot market. Hence identification, collation and reporting of commodity spot prices is a very important requirement for commodity derivative exchange. And the fact that commodity spot markets operate in isolation to the commodity derivative markets.

So, commodity derivative exchanges put significant amount of effort for identification, collation, and reporting of the commodities spot prices. Now, let us focus on how exactly these you know commodity exchanges ah create a process for reporting the commodity spot price. Please note that the commodity spot price or spot price for a commodity could be you know could be trading in any place in the any place in India. Let us say if we are talking about turmeric price, turmeric price could be traded in many parts of India in a from a local market to big wholesale mandis. So, when a commodity exchange is reporting the turmeric price, they create a process through which they will be able to collect the turmeric price on a daily basis and that information they will be able to share to the market in general.

So, how exactly this is done? This particular slide shows the spot price polling method by multi commodity exchange for aluminum. Please note the fact that commodities can have very various kinds of quality. So, when the exchanges are doing a polling for calculation of a spot price, they normally mention quality. So, the first column indicates the quality of aluminum which multi-commodity exchange considers for calculation and reporting of the spot prices. Now from whom they collect the spot price, the last column you can see the poll panel comprises representative from value chain of physical market.

So, commodity producer aluminum producers, consumer, wholesaler, dealer. So, members who are actually participating in the physical market, these are the people from whom the multi-commodity exchange collects the price information on a daily basis. And it conducts a poll and you can see the mechanism of spot price polling. So, the price is polled once a day from the physical market participants between 2 pm to 4.

30 pm. Basically multi commodity exchange representative of the multi-commodity exchanges collects that if you have traded aluminium today of this specific quality, what is the price at which you have undertaken the business. So, this is the spot price polling they collect from various physical market participants. Let us say I am a physical market participant; I am a wholesaler or a dealer of aluminium, you know rods. Now when I am quoting a price that price will be with respect to a specific geographic location. You can see that this is mentioned as X warehouse at Raipur district in Chhattisgarh.

And this particular price does not include GST. So, if I am contributing as a panel member, if I am contributing a specific price to multi commodity exchange, I would be giving the quotation as if I would be buying or selling aluminium at a warehouse near the Raipur district of Chhattisgarh and that price does not include the GST component.

So, from 2 to 4.30 pm multi commodity exchange will be calculate will be polling these prices. Once the poll prices are collected multi commodity exchange uses a trimmed mean methodology.

Basically the concept of trimmed mean methodology is that it removes the in prices which are beyond certain you know beyond certain high range or a low range. Basically, we know that you know extreme values influence the mean value. So, it removes or discards very high value or very high low value and based on some kind of a random number weight allocation it publishes it calculates and publishes a spot price for aluminium on a given day. So, this is again a snapshot which I have taken from multi commodity exchange website which reports the spot price from a different market. So, you can see cotton candy is you know one candy of cotton and the location from which you know the price has been ah the location ah location related to this particular underlying commodity that is cotton is Rajkot.

And you know if this particular screenshot which I have taken yesterday's price. So, it is about 61920 rupees spot price for cotton candy. So, different commodities you know the on a daily basis exchange informs to the market ah at large what are the spot price prevailing in the major markets. Similarly, this particular slide shows the spot price polling by the national commodity derivative exchange. It is also quite interesting to note that the national commodity derivative exchange not only collects prices from one market it collects prices from a different market that is major markets.

For example, Channa, the Channa price it conducts exactly the same methodology of polling physical market participants of Channa operating in daily market, operating in Bikaner market and operating in the Akola market. And based on the same trimmed mean methodology, it identifies and reports the daily spot price. Now with this we will come to an end on different aspects of the spot market. So, spot markets for commodities operate completely in isolation than the commodity derivative markets. In the case of a financial market, n case of a stock, bonds, both the spot market and the derivative market is in a single platform.

So, anybody has equal access to the spot price as well as the derivative prices. The fact that commodity exchanges offer derivative contracts and derivative contracts require the underlying spot prices because the derivative contracts derive its value from the spot prices. So, exchanges put a significant amount of effort into collating the price for the underlying commodity and reporting to the world at large. So, with this combining the session 2 and session 3 what are the key takeaways for ah you know for each of you, one should be knowing after these two sessions what are the e-NAMs and how the e-NAM is benefiting farmers. How commodity spot market is different than the financial spot market? What are the different types of auction mechanism relevant to the commodity market? Please note that I only discussed what are the different types of auction mechanism, but we have not probably gone into a detailed discussion that why a specific auction will be more relevant to a one commodity than the other commodity.

As we go forward we will be discussing this aspects in bits and pieces, but I would urge each of you to think that why Japanese auction in which kind of a commodity Japanese auction will be better than the Dutch auction or English auction and so on and so forth.

Also, by the end of this session, one should be able to understand and appreciate how commodity exchange collates and report the commodity spot prices. In this context, as I have said that your knowledge should never be bound by my knowledge, I would appreciate that if each of you would be able to spend some time, understanding the more from different interesting web links. So, I have given three web links here, I am very hopeful that each of you will be able to spend some time going through the details given in these three-web links to learn more about the concepts which we discussed today. So, thank you all of you, I look forward to interacting with you in the next session.