Commodity Derivatives and Risk Management

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Week-01
Lecture 04
Introduction to Forward Contract

Welcome to the fourth session on Commodity Derivatives and Risk Management. And today we are going to discuss more on different aspects of forward contracts. Now let us understand what is the primary objective of a commodity derivative exchange. As many a times I have said since the beginning that commodity derivative exchanges provide a platform for hedgers to mitigate the price risk through derivative contracts. Now what is price risk? Price risk is the risk associated with the possible change in commodity prices which may negatively affect a commodity producer, consumer, or value chain partner. And this movement of the price will lead to financial loss.

Now let us go to some examples of price risk faced by commodity producers, consumers, and value chain partners. Let us say a cardamom producer fears that the price will go down in future, a bulk swab in oil consumer fears that the price will go up in future, a cotton wholesaler who has already bought the cotton bales, but yet to identify buyers to whom it will sell this cotton bales is fearing price decline. Similarly, a cotton wholesaler who has already agreed to sell cotton bales at a fixed price, but yet to buy cotton bales fears a price increase. And these are some examples of price risk.

And these entities can enter into futures and option contracts to mitigate the price risk or hedge price risk. So, what do we mean by hedging price risk? Hedging is basically a risk management strategy which minimizes a loss in an investment or an asset by taking an opposite position in a related asset. So, if a consumer or a producer of a commodity incurs loss in the spot or cash market by entering into this derivative contract, they will be able to gain in the futures and options market or vice versa. So, these are simple basic examples of hedging price risk using your commodity derivatives. Now, coming to a forward contract, please note that the availability of derivative contracts through commodity exchange is not a mandatory requirement for commodity producers, consumer and value chain partners to mitigate the price risk.

They need not have access to commodity exchanges, but they can enter into this price risk management by entering into forward contract or option contract which are bilateral contracts or a OTC contract. So, what do we mean by bilateral contract or OTC contract which stands for over the counter contract? Let us take the example of a cardamom producer. So, what is the fear of the cardamom producer? The fear is that when the

producer is going to produce cardamom the price will go down. So, how does the cardamom producer mitigate the risk? It finds out a cardamom wholesaler and both parties enter into an agreement on a given day. Let us say today, both parties enter into an agreement and what are the terms of the contract, that both parties agree on a price of 770 rupees a kg and for 325 kgs of cardamom to be sold by the cardamom producer.

And of course, because these are commodity contract there has to be a quality specification mentioned both must be agreeing on a specific the quality which let us say we have mentioned on the Kodagu Cardamom-Suvasini variety. And when this delivery of 325 kgs will happen, that will happen on 25th day from today. And where will be the delivery location? At the firm gate of the cardamom producer. So, all these are the terms of the contract which were negotiated and agreed upon day 0 by cardamom producers and cardamom wholesalers. And in this contract please note that the cardamom producer is agreeing to deliver the underlying or sell the underlying which is cardamom here.

Hence the producer is taking a short forward position and the counterparty wholesaler is who is buying the underlying will be taking a long forward position. So, this is an example of a bilateral forward contract where both parties are informally agreeing to a term of condition. Many a times companies enter into formal agreement and that happens quite regularly. These are some of the four examples which listed below indicate the formal kind of a forward agreement. So, what are these four examples? A contract farming agreement between farmers and a company needing a specific agreement produces that is an example of a formal forward contract.

Similarly, power purchase agreement between electricity producing companies and state electricity boards or power trading companies is another example. Companies earning foreign exchange many IT companies in India they earn significant amount of foreign exchange, and they fear that if they do not do anything they may end up earning less Indian rupee and they enter into forward contract with banks to mitigate foreign exchange risk. Another interesting you know kind of a forward contract is potato cold storage owners in West Bengal, they sell the storage space rental to potato farmers much ahead of the potato harvesting season. So, these are some examples of forward contracts and as you can see the table mentions that in case of contract farming the farmers will be delivering the agree produce hence they take the short forward position and the company the contract farming company will be entering into a long forward position and the underlying is Agri commodity. Similarly, the other three cases related to the forward contract the party for short and long forward position and the underlying contract is mentioned here.

Now let us go back to a little more on foreign exchange forward contracts entered into by some of the IT companies. Just an example, this particular picture shows the number of

forward contracts Infosys has entered into for different foreign currencies as you can see from the annual report this table I have extracted. So, Infosys has entered into forward contract to sell Canadian dollar, Chinese yuan, euro, New Zealand dollar, Norwegian Krone, Singapore dollar and so on and so forth. So, what is the issue here? So, let us say Infosys is going to receive dollar 1 million dollars. So, what is the issue here? So, Infosys is going to receive dollar 1 million dollars from 65 days from today.

So, what is the fear? The fear is let us say today 1 dollar is equal to let us say 80 rupees. Now it is fearing that rupee is going to appreciate from 65 day today and it is saying I mean the Infosys chief financial officer feels that the rupee is going to appreciate and let us say rupee is going to be 78 rupees equal to a dollar. So, if they do not do anything they will end up getting 78 million rupees 65 days from today. So, to mitigate that risk so, what Infosys can do, today it will enter into an agreement with a bank where Infosys and the bank will be agreeing where Infosys will deliver 1 million dollars to the bank 65 days from today and the bank is going to give let us say 78.95 rupees. So, what is the agreement today both parties will do that on day 0 Infosys agreed to deliver 1 million dollars on the 65th day to the bank and bank in turn will pay 78.95 million rupees to Infosys. So, this is an example of a forward contract and not only Infosys almost all IT companies or any exporter which is earning foreign currency and fearing that the rupee is going to appreciate, they enter into foreign currency forward contracts with the banks. Now let us go to the not so positive aspect of the forward contract, forward contract is a contract though provide a risk mitigation strategy to counterparties, but forward contracts have a significant amount of counterparty risk. Now let us understand what we mean by counterparty risk and let us go back to our initial example where cardamom producer and cardamom wholesaler had agreed to deliver 325 kgs of cardamom at a price of 770 rupees a kg 25th day from today.

Now let us move on. So, all this agreement was done on day 0. Now let us say today is 11th May 2023. So, both parties are agreeing to 25 days. So, let us say on 6th June 2023.

So, on 6th June 2023 in the local market let us say cardamom price is rupees 800. That means, without the contract the market is going to be in the local market. So, on 6th June 2023 in the local market let us say cardamom price is rupees 800. So, let us say on 6th June 2023 in the local market let us say cardamom at 800 rupees. So, without the contract the producer would have sold cardamom at 800 rupees with the contract it is obligated to sale at 770 rupees.

So, without the contract this particular producer would have received 800 rupees now it is it has to deliver at 770 rupees. So, it will be incurring a loss of 330 rupees a kg. Similarly, let us take another situation the cardamom price suppose is rupees 700. If cardamom price is rupees 700 it would gain 70 rupees a kg without the contract it would have sold at

700 rupees with the contract it is gaining 70 rupees. So, this particular diagram as you can see this particular diagram shows the payoff of long forward position and short forward position.

So, what that means, let us say if it would have been 7 800 if it price is 800 the short forward position holder that is you’re the short forward position holder that is your cardamom producer this is your cardamom producers payoff. And this is the payoff for the cardamom wholesaler. So, this is your short forward position holder please note that these payoffs are mirror image to each other. So, if price is 800 cardamom producer will be very happy to sell cardamom at 770 and the cardamom wholesaler will be unhappy and vice versa if the price is 700, the cardamom wholesaler will be I am sorry if the price is 800 the cardamom producer will be very unhappy and because it is pressure it is being it is selling cardamom at 770 rupees and it is unhappy because it is incurring a loss of 30 rupees a kg. Let us say if it is 700 rupees price it will be selling cardamom at 770 rupees and will be benefiting 70 rupees from the contract.

So, this particular diagram shows the payoff for both long and short forward and as you can see these are mirror image of each other that is the gain of one party is exactly equal to the loss of other party. So, that brings to a very important concept related to derivative contracts. Derivative contracts are a zero-sum game as I mentioned earlier that if the price is 800, 30 rupees benefit to the cardamom producer and 30 rupees loss to the cardamom wholesaler. So, this aspect of zero-sum game ensures that the party which is losing may try to default on this contract. So, that is the counter party risk.

So, when we say that a forward contract has a counter party risk. So, the party inevitably one party is going to lose unless the price is exactly 770 rupees on the 25th day. Any price other than 770, one party is going to incur loss vis-a-vis the other party and the party which is going to incur loss that party may go back on his or her word or may pressurize the other party to renegotiate the earlier contracted price and other terms of contract. Now, the question is, does it really happen? Please note that even not only in informal agreement like your cardamom wholesaler and cardamom producer even a very formal agreement parties try to negotiate the terms of the contract, the party which is incurring losses that party would like to pressurize the other party to negotiate the earlier contracted terms and conditions. In this context, I would like to discuss little bit on the gas authority of India wanted to rework the US LNG price deal.

So, this particular so, more detail about this contract renegotiation is mentioned here or I am going to discuss here at this point in time. Please note that the gas authority of India and Cheniere Energy of USA entered into a 20-year forward contract. In this contract GAIL is supposed to buy 5.8 million tons of LNG which is liquefied natural gas per

annum for 20 years. The contract started in 2021 and it was supposed to go up to 20 ok it will be 2031 not 2021.

And what was the negotiated price the negotiated price was some fixed component of USD 3 dollar per British thermal unit plus 115 per cent of the final settlement price of the New York Mercantile Exchange Henry herb natural gas futures contract. So, this is anyway at this point in time let us not focus more on this negotiated price. Both parties agreed to some terms of the contract and in 2017, GAIL wanted to renegotiate the price. So that the landed cost of LNG in India to be around 7 to 8 dollars per mm btu rather than the present 9.7 dollar per mm btu. Of course, finally, whether GAIL could renegotiate this contract or not I do not have this information at this point in time. So, what I am drawing your attention to is that even big companies with a formal agreement try to renegotiate the terms of contract because one party is incurring a loss. In this context Chenier had mentioned Chenier current recently the only US company exporting LNG is reportedly not in favor of reopening the signed contract as it expects the signed take or pay agreement to be honored. So, one party does not want to renegotiate the contract while the other party wants to renegotiate the contract. So, this happens pretty regularly for almost all forward contracts.

So, this one party wanting to change the terms of the contract is an example of a counter party risk. And this counter party risk becomes much more serious if one party is either a monopoly or a near monopoly or the one party is a monopsony company. So, now, let us go back to a little more on who is a monopoly and who is a monopsony and how they have higher how they how they exercise higher power over the counter party. Let us say let us go back to our example of cold storage owners and potato farmers. So, let us say on day 0, before harvesting of the potato let us say both parties have entered into an agreement where potatoes farmers will be storing potato from second month from today till let us say 6 month that is 8 months.

And what is negotiation? That farmers will pay let us say rupees 14 rupees per 100 kgs of potato per month. And let us say for one farmer has farmer a has agreed for 100 quintal farmer b has agreed for let us say 400 quintals and so on and so forth. So, this agreement happened on day 0 between different farmers and the cold storage owner. Now, let us say we move to maybe 1.5 months you know about 40 45 days from today and the cold storage owner sees that there is a bumper production of potato and lot many people are willing lot many farmers are willing to pay a higher rental for storing potato.

So, in that case the potato cold storage owner may go back on it is word and say that no I do not want to rent my cold storage by receiving only 14 rupees for 100 kg now you have to increase that fee. And if the cold storage owner is a monopoly let us say monopoly is somebody who is a monopoly is a market which is dominated by a single seller and many buyers. So, this is an example what this this example is a classic case of monopoly. So,

let us say cold storage owner in let us say in West Bengal there is about 600 cold storage own cold storages. Let us say out of which 450 is owned by a single family or a company.

So, this will be an example of a typical monopoly market. So, single seller and many buyers and if the cold storage owner wants to go back on its word and say that we do not want to rent at 14 rupees now you have to pay me 20 rupees or 22 rupees farmers have nothing they cannot do anything they have nowhere to go and they will be forced to renegotiate this contract. In the case of a monopoly market the forward contracts renegotiation the renegotiation power shifts from the one party to the counterparty which is the seller of the underlying asset. Now, let us go to the next situation where you have a monopsony market.

So, ok so, let me erase off. So, this is an example of let me the monopsony. So, monopsony is a market which is a market which is a monopoly market monopsony is a market where you have a single large buyer and many sellers. So, let us go back to our contract farming agreement where there is the contract farming company which normally is a single buyer, and the many sellers are the farmers. Let us say exactly similarly on day 0 both parties are agreeing that whatever the farmers are going to produce between you know between some dates the farmers will be delivering the underlying agri commodity to the contract farming company at a let us say negotiated price of 40 rupees a kg let us say for tomato.

So, this agreement is being done on day 0. Let us say one month into the agreement the contract farming company finds that there is bumper production of the of tomato and if it buys 40 rupees a kg it is basically paying a very high price. So, it may try it may try to renegotiate the contract or may say completely go back on its work to buy tomato by saying that the quality of the tomato is not up to the mark and hence it will not be able to buy potato at 40 rupees a kg. In that case farmers are in a significant disadvantages position because they have to go ahead and sell the tomato to somebody else at a market price. So, in case of a forward contract if one party is monopoly or monopsony market then the chances of contract renegotiation happening is very high and that is the chance is the counter party risk which is a significant risk associated with a forward contract. With this we will end this session and we will be starting in the next session we will continue with the remaining aspect of the forward contract. Thank you all of you.