

Commodity Derivatives & Risk Management
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Lecture 02
Introduction to Commodity Derivatives (Continued)

Welcome to the second session of Commodity Derivatives and Risk Management. Before I proceed to the today's agenda let us revise what we discussed in the session one; In the session one we discussed how commodities are emerging as a new asset class and Investment in commodities through commodity derivative contracts are being turned to diversify portfolio risk and return.

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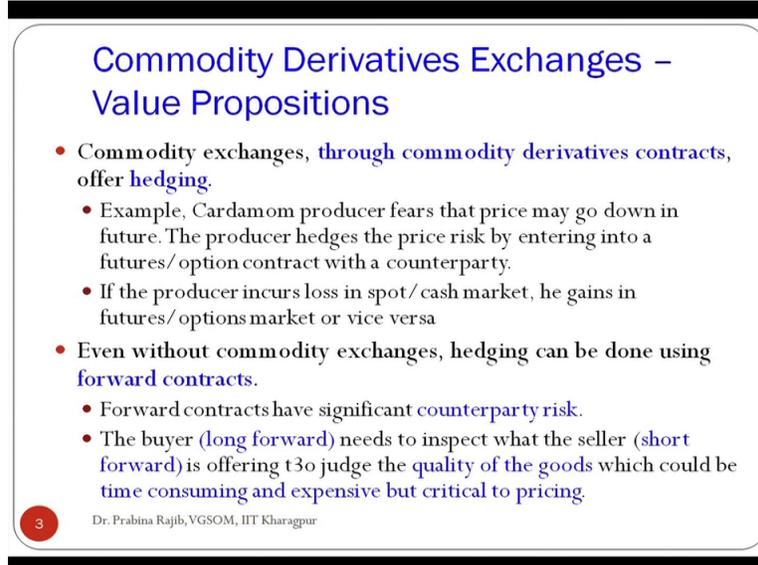
Session 1(Salient points)

- Commodities are emerging as **new asset class**.
 - Investment in commodities are predominantly done through commodity derivatives contracts.
- Commodity spot exchanges are different than commodity derivatives exchanges.
- In India National level multi-commodities are empowered to offer contracts on all commodities permitted by regulators while regional commodities have to take permission for offering contracts for each and every commodity underlying.

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Commodity spot exchanges are inherently different than commodity derivative exchanges. And in India, National Level multi commodity exchanges are empowered to offer contracts on all commodities while regional commodity exchanges have to take permission on selective basis for offering contracts on different underlying.

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Commodity Derivatives Exchanges – Value Propositions

- Commodity exchanges, through commodity derivatives contracts, offer **hedging**.
 - Example, Cardamom producer fears that price may go down in future. The producer hedges the price risk by entering into a futures/option contract with a counterparty.
 - If the producer incurs loss in spot/cash market, he gains in futures/options market or vice versa
- Even without commodity exchanges, hedging can be done using **forward contracts**.
 - Forward contracts have significant **counterparty risk**.
 - The buyer (**long forward**) needs to inspect what the seller (**short forward**) is offering to judge the **quality of the goods** which could be **time consuming and expensive but critical to pricing**.

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Let us go to today's agenda that is, what are the value propositions offered by Commodity derivative exchanges. The first value proposition which all of us are aware of is that commodity exchanges offer hedging or price risk mitigation mechanisms. So let us understand what do you mean by hedging? Let us as an example, let us say a cardamom producer from Kerala is hearing that the price may go down in future, suppose in the month of May the producer feels that when he gives the produce in the month of September the price is going to go down and unless he does something he may end up getting a lesser price for his cardamom produce. So how this cardamom producer can mitigate the risk through a commodity derivatives commodity derivative contracts, let us say the producer enters into a short futures contract.

Why the producer will enter into a short futures contract because the producer is long on asset that is the producer is going to own the underlying asset and to mitigate that long asset price risk associated with long asset it will enter into a short futures contract. Now, on the contract maturity date if his fear has been right that is price in the spot market has gone down he will incur loss on his spot market transactions; however he will gain in the short futures position which he took in the in that commodity exchange.

Suppose he has not been right and cardamom prices have gone up, he will benefit in the spot market, however he will incur loss in the short futures position which he took earlier. Is hedging opportunity which is available to a commodity producers and consumers through commodity

exchanges or can only be done through commodity exchanges? The answer is no. Commodity producers and consumers have used forward contracts for you know thousands of years for mitigating the price risks.

However, commodity forward contracts or any forward contract has a counter party risk. And another important dimension of trading or entering into a forward contract is that in case of a forward contract the buyer or the party which is interested to take the long forward position needs to inspect what the seller is offering to judge the quality of the goods which could be time consuming and expensive but critical to pricing.

Now let us discuss little more on counter party risk Let me take an example, or let me revisit example of cardamom producer, let us say on the spot date date that is 26 May 2016 the cardamom producer would like to mitigate the price risk. Cardamom producer is long on asset it would like to mitigate this risk by taking short forward contract.

Now, who will be the counter party, let us see the cardamom producer contracts the gets in touch with local wholesaler and the wholesaler becomes the counter party to the commodity producer. So the obviously the wholesaler will be will be short on the asset and it will take long forward contract. What are the other terms of the contract? So, let us write down the terms of the contract.

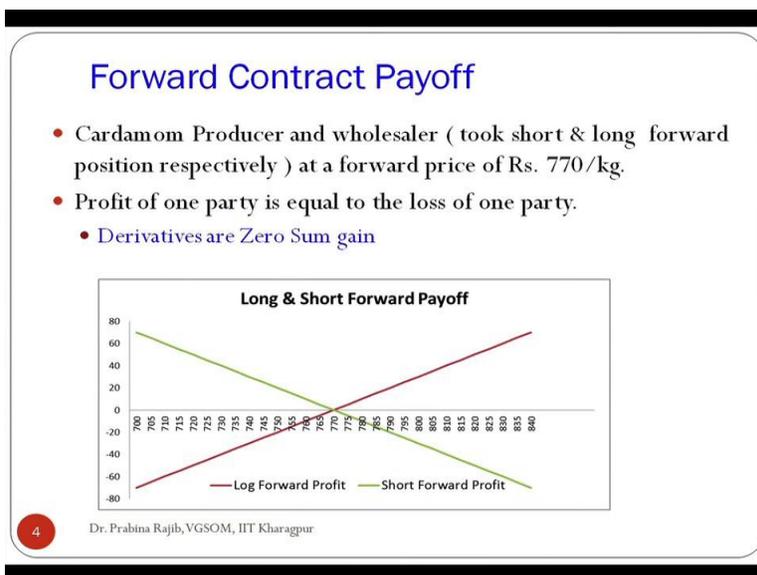
So, what both parties agreed on a forward price of 770 rupees per kilogram, delivery date that is 2 months 10 days from now that is let us say, 6th August 2016 and delivery location house of the wholesaler. These terms of the contract were agreed upon the spot date. Now, let us go to the contract maturity date let us say that is on 6th August. Let us analyze the different price with may prevail on 6 th August.

Let us see in the local mandi a local wholesale market similar kind of cardamom is selling at let us say 820 rupees per kilogram; that is spot price prevailing on 6 th August is 820 rupees kilogram. Now if, the cardamom producer delivers as per its as per the contract he will be realizing the producer will receive 770 rupees per kilogram without the forward contract he would have been able to sell it at 820 with the forward contract if he abides by his side of the contract he will be delivering at 770 rupees per kilogram.

So, this will lead to a loss of 50 rupees a kilogram for the producer. Now, let us take another price, let us take spot price of let us say 700. Suppose on 6 th August the spot price which is prevailing in the market is 700 rupees per kilogram, so the producer will still receive 770, producer will receive 770. However, the wholesaler will be very unhappy because he is paying 770 when similar kind of a cardamom is being sold in a local market at 700. So, the producer will receive 700 so it will be a gain for, gain of 70 rupees per kilogram.

Now, in this situation, that is, your situation A: when the producer is losing 50 rupees, the wholesaler will be gaining 50 rupees; in the situation B: when the producer is gaining 70 rupees the wholesaler will be incurring 70 rupees.

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Now let us go back to our power point slide, as discussed cardamom producer took short futures contract and the wholesaler took long forward contract. Let me repeat cardamom producer took short forward contract and the wholesaler took long forward contract and both parties agreed at a price of 770 rupees per kilogram and depending upon the prevailing price on the contract maturity date that is the 6 th August 2016 one party will gain and another party will lose.

Let us see the price of 820. When the price is 820 the short forward position holder that is the cardamom producer will incur a loss of 50 rupees per kilogram because without the forward contract you will be selling cardamom at a spot market price of 820 with the forward contract and if he abides by his side of the bargain and delivers the cardamom delivers cardamom at 770

he will be incurring 50 rupees of loss. And when he is incurring 50 rupees of loss, the long forward position holder that is the wholesaler will be gaining 50 rupees. So loss of short forward position is equal to the gain of the long forward position.

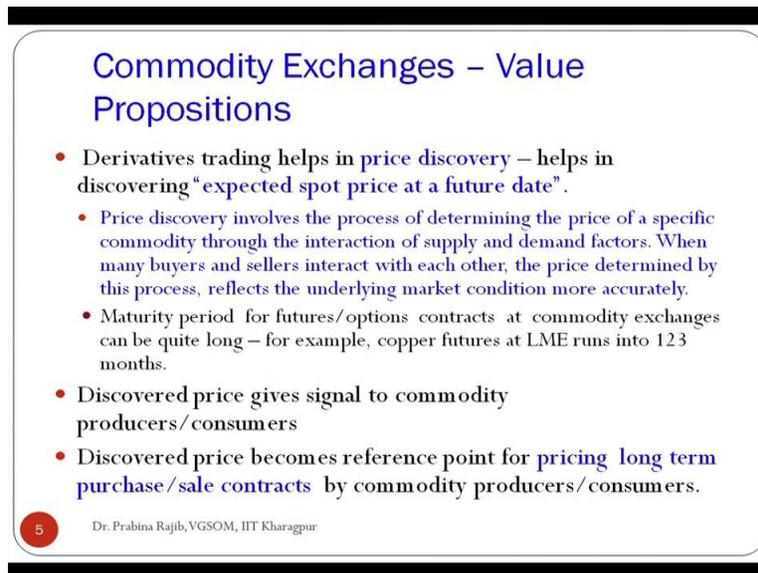
Similarly this side of the contract; Let us see the prevailing market price is 700 rupees, so if the prevailing market price is 700 rupees, so without the contract without the contract the commodity the wholesaler would have got cardamom at a price of 700 rupees and with the contract now he may have to (12:45) 770 rupees per kilogram so this is his loss and 70 rupees 70 rupees a kilogram loss and when he is incurring loss the counter party that is short forward position holder will be incurring profit or gaining profit.

Now, as we know before that derivative contracts are Zero Sum Gain so profit of one party is equal to the loss of one another party. So, when traders are entering traders are undertaking long long or short futures contract in commodity exchanges they will not have to worry about counter party risk; they also have to not worry about the quality risk or the delivery risk.

Now, on a lighter note have you come across a situation where you can sight an example where a people have not abided by a forward contract? Okay! All engagements are of forward contracts and we have seen many times people not getting married after engagement, even after getting engaged. So, this is an example of you know counter parties not abiding by their side of the bargain whatever could be the reason but counter party counter party is not abiding the forward contract so this happens also in business situation if in this case if prevailing market price will be substantially higher the copper sorry the cardamom producer will not be interested to deliver the underlying to the wholesaler and if prices are substantially lower the wholesaler will not be interested to buy the cardamom from the producer at 770 rupees a kilogram.

At this point of time, I would like to mention here that commodity derivatives trading or futures trading at commodity exchanges also have certain other risk they may not have counter party risk, they may not have quality risk, they may not have delivery risk. However, they have other kinds of risk which is known as a basis risk, but at this point of time we will not be going into into the discussion of basis risks because basis risks would be covered in subsequent sessions.

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Commodity Exchanges – Value Propositions

- Derivatives trading helps in **price discovery** – helps in discovering “**expected spot price at a future date**”.
- Price discovery involves the process of determining the price of a specific commodity through the interaction of supply and demand factors. When many buyers and sellers interact with each other, the price determined by this process, reflects the underlying market condition more accurately.
- Maturity period for futures/options contracts at commodity exchanges can be quite long – for example, copper futures at LME runs into 123 months.
- Discovered price gives signal to commodity producers/consumers
- Discovered price becomes reference point for **pricing long term purchase/sale contracts** by commodity producers/consumers.

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Now, let us go to the second value proposition offered by commodity exchanges. Derivative trading helps in price discovery and when we are meaning when we are talking about price discovery, what we mean is that, price discovery involves the process of determining the price of a specific commodity through the interaction of supply and demand factors. When many buyers and sellers interact with each other the price determined by this process reflect the underlying market conditions more accurately.

So, when we are talking about price discovery, it helps us in getting an idea regarding what is going to be the expected spot price which is going to prevail at a future date. A trader may not be coming to a exchange platform to mitigate the risk. However, the prices which are arrived or prices which are getting traded the futures contract or option contract which are getting traded in the exchange platform can give an indication regarding the expected spot price. And that discovered price give signal to the commodity producers and consumers. And this discovered price becomes reference point for pricing long term purchase or sale contract by commodity producers and consumers.

In fact many commodity producers and consumers use the forward futures price announced or informed by the commodity exchanges for entering into long term forward contract.

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LME price as a global benchmark

- Prices discovered on LME trading platforms for various commodities for different maturity period are used as reference prices by major world players.
- Rio Tinto Annual Report 2015 (page 150)
 - “Metals such as copper and aluminium are generally sold under contracts which vary in tenure and pricing mechanisms, with some volumes sold in the spot market. The prices are determined by reference to prevailing market prices on terminal markets, such as the [London Metal Exchange \(LME\)](#) and [COMEX in New York](#)”
- Vedanta Annual Report 2014 (Page 164)
 - “The requirement of the primary raw material, alumina, is partly met from own sources and the rest is purchased primarily on negotiated price terms. [Sales prices are linked to the LME prices](#). At present the Group on selective basis hedges the [aluminium content in outsourced alumina](#) to protect its margins.”

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Let me give you some example of this, London Metal Exchange is considered to be the largest exchange offering the futures and options contractson base metals.Now, this particular slide shows how two companies Rio Tinto and Vedanta use the price arrived at futures price arrived at London Metal Exchange to price their long term contract.

Let me read out the details which I have taken from the annual reports of these two companies.

Rio Tinto Annual Report 2015 page 150 indicates the following: Metals such as copper and aluminium are generally sold under contract which vary in tenure and pricing mechanisms, with some volumes sold in the spot market. The prices are determined by reference to prevailing market prices on terminal markets, such as the London Metal Exchange (LME) and COMEX in New York.

Vedanta Annual Report 2014 page 164 indicates the requirement of the primary raw material, alumina, is partly met from our own sources and the rest is purchased primarily on negotiated price terms. Sales prices are linked to LME prices.

So these two m information indicates the importance of prices which are discovered at the commodity exchanges and how companies are using these discovered prices to price their own long term buy and sell agreements.

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Commodity Derivatives Exchanges – Value Propositions

- In India, commodity derivatives trading has given impetus to
 - Creation of New warehouses
 - Warehouse certification mechanisms
 - Issuance of warehouse receipts
- In general, warehousing ecosystem has got a fillip in India.
- Warehouse receipts
 - are not only used to trade in commodity exchanges
 - secure loans from banks and financial institutions.
- Warehouse receipt financing by Indian Banks
 - Many Indian banks have started offering loans with warehouse receipt as collaterals.
 - Warehouse Receipt finance: A game changer in agri finance (BusinessToday, March 7, 2016)

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Now let us go to the third or another important value proposition of provided by commodity derivative exchanges. This is very peculiar to India. In India commodity derivative trading has given impetus to warehouse eco system. When we are talking about the warehousing eco system means, after the commodity derivative trading, many new ware houses have come up and ware house certification mechanisms have developed and these ware houses are issuing warehouse receipts.

Why the commodity derivatives trading has given has given impeters to the warehousing eco system? Because many times producers and consumers of commodities, when they enter futures contract or option contract in a in commodity exchange in India as I mentioned already future contracts are available so when you know consumers consumers and producers of commodities enter into futures contract and they are interested to take delivery of the underlying or deliver the underlying through the exchange platform, these their contracts have to be associated have to be associated with ware house receipts.

So exchanges have facilitated in creation of many warehouses and also the whole mechanism associated with issuance of ware house receipts have been undertaken with the help of the commodity exchanges.

Now, ware house receipts are not only used by the traders to trade commodity contracts in these exchanges. Another interesting condition has developed in Indian context. These ware house receipts are used by the owners of the commodities to secure loans from banks and financial institutions.

Is financing warehouse receipt new in India? Definitely not ware house financing is quite old. However the quantum of loan which was given by Indian banks for ware house receipt financing was very small. Since last five to six years there has been tremendous growth in by banks where in which they are using the warehouse receipt as a collateral and providing loans to the owners of the commodity.

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**LOAN AGAINST RECEIPT OF WAREHOUSE/COLD STORAGE
(FOR TRADERS/ PROCESSORS/ARTHIYAS)**

http://www.unionbankofindia.co.in/RABD_ShortLoan_LoanWarehouseReceiptTrader.aspx

Objective

Purchase of Raw materials for Food & Agro Processing Industries during harvesting season when commodity prices are low.

Quantum of Loan

Up to 60-75 % of the value of commodity

Value of the commodity will be lower of the following-

1) Value of commodities based on the prices from the nearest government approved mandi(APMC) on the date of disbursement.

2) Price cap of the commodity fixed by bank.

At this juncture I would like to share, How Union Bank of India sanctions loans against the warehouse receipt. This particular detail I have downloaded from the Union Bank of India website. The title of this particular document is loan against receipt of ware house and cold storage.

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Eligibility

Food and Agro based processing unit using agriculture commodities as raw material, Proprietorship concerns/partnership firms/ corporate/individuals trading in agricultural commodity and Arthiyas in rural and semi urban areas.

Approved warehouses:

Central warehousing corporation(CWC), state warehousing corporation(SWC) and other godowns managed by the Collateral Management Agencies (CMA)

Security

Pledge of warehouse Receipts of approved warehouses.

COMMODITIES APPROVED
Wheat, Rice (Common), Rice (Fine), Paddy (Common), Paddy (Fine), Paddy(Super Fine/Basmati), Soyabean, Cotton Bales-Medium Staple, Cotton bales-Long Staple, Rubber, Sesame seed, Castor seed
Masur, Masur dal, Maize, Gram, Chana dal, Cotton Seed, Tur, Tur dal, Urad, Moong, Groundnut Seed (Kernels), Ground nut in shell, Black pepper, Mustard, Sunflower, Jaggery, Guar seed, Guar gum, Cotton seed oilcake, Ground nut oilcake, Mustard oil cake, Soya oilcake, Yellow peas, Bajra, Jowar, Jeera, Jute

And as you can see the quantum of the loan is upto 70 percent of the value of the commodity. And, What is the security for this particular loan? The place of warehouse receipts of approved ware houses. And, what are the commodities approved? Wheat, Rice, Rice paddy and all these you know Maize, Gram, Chana Dal, Cotton, Cotton seed, oil cake Jeera Jute etc. are can be ware house receipts for these commodities can be placed and the bank sanctions loan.

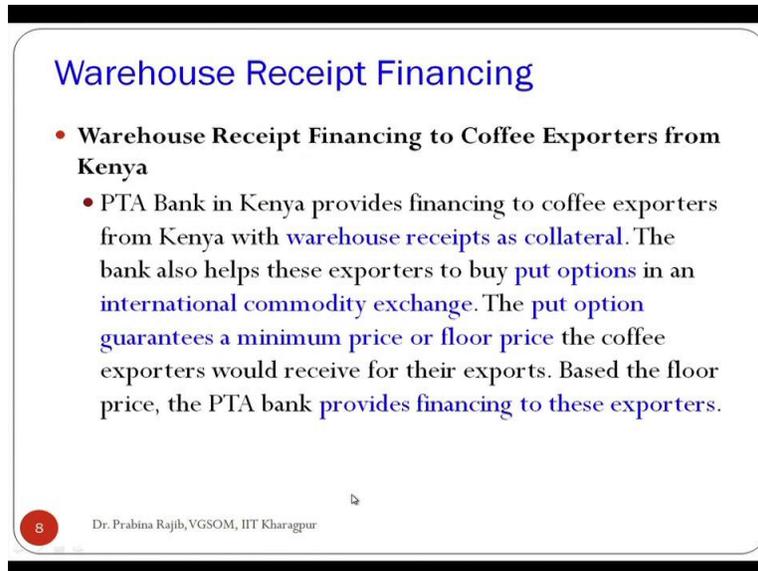
And this has done the world of good to the farmers, because in India we know many farmers because of lack of storage facility they undergo distress sale and end up getting a very meager amount. So with this facility they can store their goods in approved ware houses. Take the warehouse receipt to a bank and get the finance as and when they decide they get a better price they are able to they are they can sale the underlying good and recover a better price.

And this whatever loans they are getting taking from this by placing these ware houses since they are also ploughing back for the next farming season or buying seeds, buying fertilizers and other investments in in becoming you know generating more better farming to generate basically better revenue for the next year.

At this point of time I would also like to share an another article which has been published by Business Today. This article is ware house receipt finance, A game changer in agri finance. It's an interesting article, as per this particular article some ten years back collectively all Indian banks were sanctioning warehouse receipt loan to the (())(25:14) of Four thousand crore and

within these ten years ware house receipt financing has grown to forty thousand crore and as they each of these bank is using these ware house receipts as collateral for providing the loans.

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Warehouse Receipt Financing

- **Warehouse Receipt Financing to Coffee Exporters from Kenya**
 - PTA Bank in Kenya provides financing to coffee exporters from Kenya with **warehouse receipts as collateral**. The bank also helps these exporters to buy **put options** in an **international commodity exchange**. The **put option guarantees a minimum price or floor price** the coffee exporters would receive for their exports. Based the floor price, the PTA bank **provides financing to these exporters**.

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Again as I mentioned is it unique to India? Definitely not. This particular case let indicates the how the commodity exchange banks and warehouses are helping farmers in realizing better profit. PTA Bank in Kenya provides financing to coffee exporters from Kenya with ware house receipts as collateral. The bank also help these exporters to buy put option in an international commodity exchange. So when these farmers are buying the farmers are buying or coffee producers are buying put option it guarantees them a minimum receipt minimum floor price and that based on that floor price this Kenya PTA bank of Kenya is providing financing to these exporters.

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Warehousing Development in India

- Government of India (GoI) introduced the **Warehousing (Development & Regulation) Act 2007** and set up the **Warehousing Development & Regulatory Authority (WDRA) in 2010.**
- The GoI also made **warehouse receipts negotiable** in 2011,
 - Negotiability -- Ownership of warehouse receipts can be transferred between buyers and sellers without physically transferring the underlying goods.
- Warehouse receipts are also issued in **dematerialization form** so that the hassles of paper transactions are not there.

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In India, though commodity exchanges have contributed towards the eco system but the actual development has been undertaken by Warehousing development and Regulatory authority. Understanding the need of regulating and promoting the warehousing ecosystem in India Government of India introduced ware housing development and regulation account in 2000 and set up a regulatory body called Warehousing development and Regulatory Authority in 2010. And Government of India also made ware house receipt negotiable in the year 2011. What do you mean by negotiability? Negotiability of ware house receipts indicate that the ownership of ware house can be transferred buyers and sellers without physically transferring the underlying goods.

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Commodity Exchanges – Value Propositions

- Commodity exchanges offering derivatives contracts on specialized commodity such as **weather parameters**.
- Though insurance contracts are able to mitigate catastrophic weather related risks such as flood, earthquake etc., derivative contracts on **rainfall, snowfall and temperature** etc help in mitigating **high frequency low severity** weather events.

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And Commodity exchanges also offer another interesting value propositions, this is by offering weather contracts. Of course these contracts are not available in Indian exchanges, ((
(28:45)certain global exchanges, international exchanges like Chicago Mercantile Exchange offers contracts on weather parameters such as rainfall, snowfall, temperature. All of us we know that risk associated with weather can be mitigated through insurance contract. But these insurance contracts helps us in mitigating low frequency high impact losses.

However derivative contract which are traded on commodity exchanges helps us in mitigating high frequency low severity weather events.

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Commodity Derivatives Trading – negative side?

- At times, derivatives trading is perceived to contribute towards excess volatility in commodity prices.
- For example, during October 2011 to March 2012, Guar seed and guar gum futures prices rose significantly.



- Guar Seed price rose from Rs. 4200 (for 100 kgs) to Rs. 32000 for during the above period
- Guar Gum price increased to 900 per cent from Rs. 11000 per 100 kg to Rs. 98000 during the same period.
- This increase was attributed to excessive speculation in futures market.
- FMC suspended futures trading in these two commodities during March 2012.

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Thus commodity derivative trading have some negative side of course they have some negative sides. What is the negative side? One of the important negative side is that at times derivative trading is perceived to contribute towards excess volatility in commodity prices, for example during October 2011 to March 2012 Guar seed and guar gum futures prices rose significantly.

So, this is a picture of guar gum sorry guar seed this is a agricultural produce and seeds from these you know crushed to arrive at to to prepare guar gum and this guar gum is used for extracting cell oil.

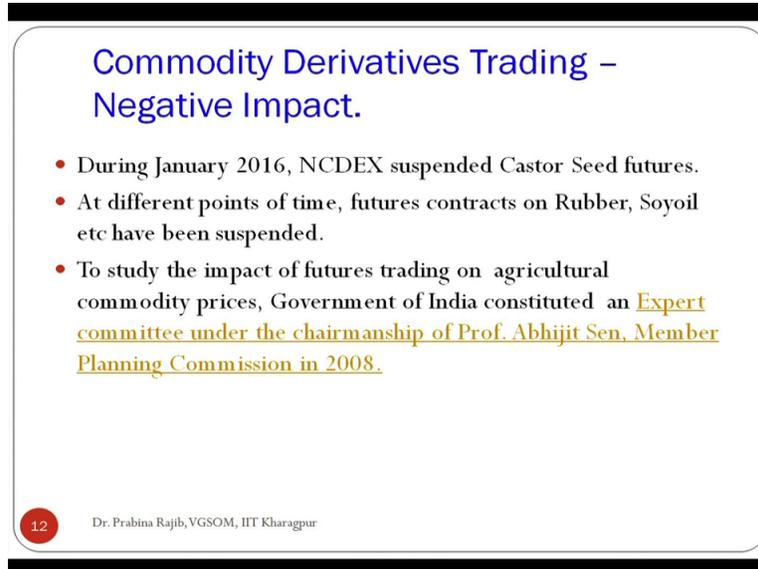
And, because of the significant volatility in future prices the guar seed spot prices rose from 4200 to 32000 during over a period of 6 to 7 months. Similarly, guar gum prices also increased from 11000 per 100 kilogram to 98000 during the same period. This increase was attributed to excessive speculation in the futures market.

So whenever there is a high volatility in futures market that impacts the volatility in the spot market, or price increases in the spot market. So, there is a nice article which I will be uploading for anyone of you who will be interested to read. But how the volatility and spot prices contributed to the price rise in the sorry volatility in the futures market contributed to the and price rise in the spot market, you can spend some time reading this article.

Now forward market commission (())(31:31) regulator suspended futures trading in these two commodities during March 2012 and subsequently these two commodities have been permitted

to futures contract on these two commodities have been permitted and now futures contract on guar gum and guar seed is being traded at NCEDEX.

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Commodity Derivatives Trading – Negative Impact.

- During January 2016, NCDEX suspended Castor Seed futures.
- At different points of time, futures contracts on Rubber, Soyoil etc have been suspended.
- To study the impact of futures trading on agricultural commodity prices, Government of India constituted an Expert committee under the chairmanship of Prof. Abhijit Sen, Member Planning Commission in 2008.

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Similarly, during January 2016 NCDEX suspended Castor seed futures contract. At different point of time futures contract on rubbers, soya oil, etc have been suspended. And, to study the impact of futures trading on volatility of agricultural prices in the year 2008 committee of India constituted a high profile committee or expert committee under the chairmanship of Professor Abhijit Sen within member of the planning commission and this particular expert committee submitted its recommendation in the year 2008.

This is a beautiful nice document it rounds into 109 pages. I will also be providing the this particular document. I on my own , my interpretation on this particular document I am refrending from giving because considering the length and considering the interesting finding and interesting dimensions which they have analyzed its worth giving a reading and formulate your own views and interpretation of the outcome which of the suggestions or recommendations given by this particular report.

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Key Takeaways (Sessions 1 & 2)

- How commodity derivative exchanges are different from spot exchanges ?
- What are the value propositions of commodity derivatives exchanges?
- Do spot markets/ spot exchanges also help in price discovery?
- What is the difference between National Level Multicommodity Exchanges and Regional Commodity Exchanges in Indian context?
- What is difference between negotiable and non negotiable warehouse receipts ?
- What are the benefits of dematerialization of warehouse receipts?
- Why trading in future contracts can lead to excessive speculation and price manipulation and not in forward contracts?
- What are the major recommendations of given by Expert Committee (under the chairmanship by Prof. Abhijit Sen) which studied the impact of futures trading on Agricultural prices.

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So this brings an end to our discussion on the introductory session on Commodity Derivatives. So, what are the key takeaways from these two sessions? So you will be after listening to these two lectures sessions and reading the associated files you will be able to understand how commodity derivative exchanges are different from spot exchanges. What are the value propositions of Commodity Derivatives exchanges?

Do spot market or spot exchanges also help in price discovery? What is the difference between National Level Multi Commodity Exchanges and Regional Level Commodity Exchanges in Indian contexts? What is the difference between negotiable and non negotiable Ware house receipts? What are the benefits of dematerialization of ware house receipts? Why trading in futures contract there is a mistake on my part, so, why trading in futures contract can lead to excessive speculation and price manipulation not in forward contracts? so in this context please add an s here.

What are the major recommendations given by the Expert Committee under the chairmanship of Prof. Abhijeet Sen which studied the impact of futures trading on Agricultural prices?