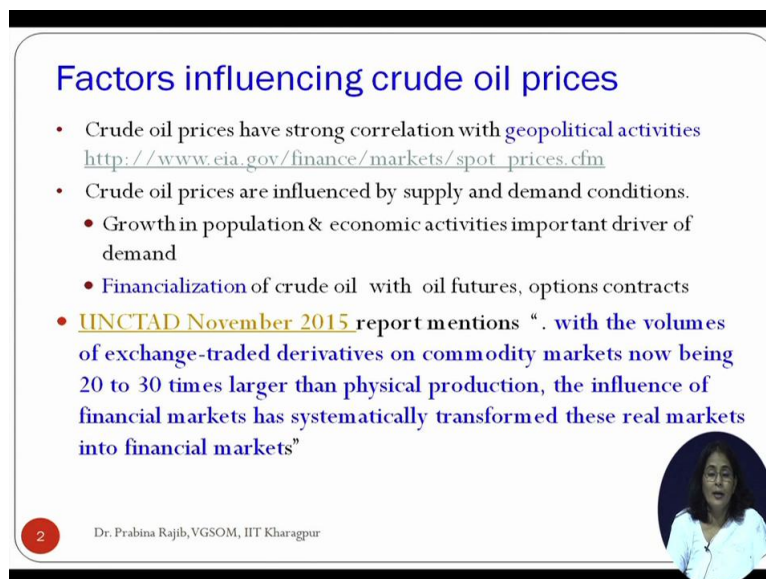


**Commodity Derivatives and Risk Management**  
**Professor Prabina Rajib**  
**Vinod Gupta School of Management**  
**Indian Institute of Technology Kharagpur**  
**Lecture 24**  
**Spot-Futures Relationship in Crude Oil**

Ok welcome to the next session on Commodity Derivatives and Risk Management, if you recall we started discussing, what are the major factors which influence the crude oil price. As I see it identifying all factors is almost next to impossible because you never know what is happening where who is having an impact on crude oil price, so it is very extremely difficult if somebody sees that I know exactly what factors influence the crude oil price. But sitting today we are going to be discussing what are the major factors which has which have bearing on crude oil price. So discussion probably today we will be hovering around the factors which is influencing WTI crude. The same factors is also applicable for influence same factors also influence the other crude oils which are crude variety oils which are produced all over the world.

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**Factors influencing crude oil prices**

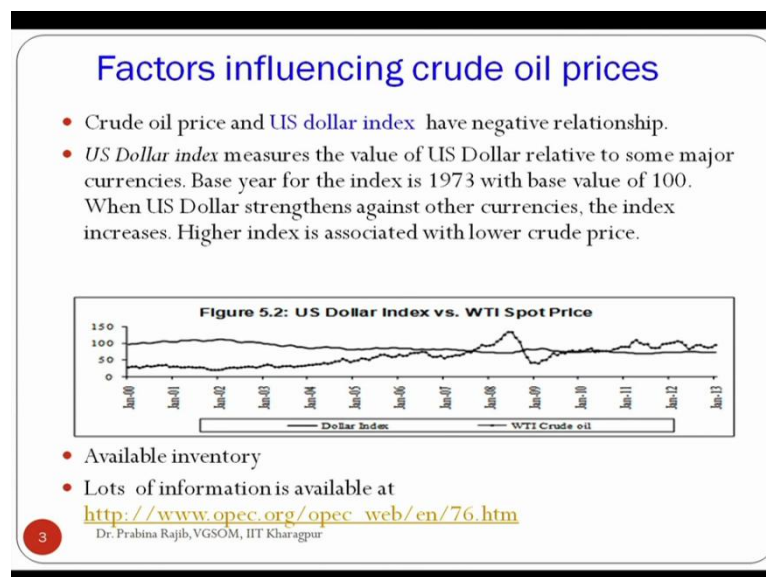
- Crude oil prices have strong correlation with **geopolitical activities**  
[http://www.eia.gov/finance/markets/spot\\_prices.cfm](http://www.eia.gov/finance/markets/spot_prices.cfm)
- Crude oil prices are influenced by supply and demand conditions.
  - Growth in population & economic activities important driver of demand
  - **Financialization** of crude oil with oil futures, options contracts
- **UNCTAD November 2015** report mentions “ . with the volumes of exchange-traded derivatives on commodity markets now being 20 to 30 times larger than physical production, the influence of financial markets has systematically transformed these real markets into financial markets”

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Uh if you recall we were discussing last class in this particular slide and we started with discussion on the happening of the geopolitical agents and its influence on crude oil and um, as I mentioned if you recall in the last session that during September 2011 the crude oil price the WTI crude oil price was quoting at 25 dollar discount to the Brent price, so there could not be any reason other than 911 affecting the affecting the price of WTI vis-a-vis the North C Brent crude oil.

So other geopolitical events has always influenced crude oil price. So crude oil price is extremely sensitive to whatever is happening at major crude oil producing nations as well as the geopolitical activities at major crude oil consuming nations. So the next one is the supply demand situation, we also discussed about the financialization of crude oil through the trading of derivatives contracts and how it is influencing the crude oil prices. In fact, crude oil is one of the largest crude oil has the maximum amount of derivatives trading done by non commercial producers and consumers, so lot many (3:28), banks, financial institutions, investors speculators who have nothing do with this particular commodity parse they have entered into futures and options contract for making some profit.

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Another factor which influences the crude oil price is the US dollar index. So US dollar index has a negative relationship with the crude oil price, so let us understand what US dollar index is. It is a index which measures the value of US dollar related to some major currencies, and this index has the value of 100 and base year is 1973 and when US dollar strengthens, the this index increase and whenever this index increases crude oil price goes down. And this particular which you are seeing this is a relationship between US dollar index and WTI spot price and though it is not mentioned here, the correlation between US dollar index and WTI spot price during January 2000 to January 2013 during these 13 years hovered around negative 0.88.

So where I got this particular picture, in fact one thing I would like to share with you all today that I have written a book on Commodity Derivatives and Risk Management and this particular book is published by PHI learning and in fact in fact my interest for commodity

derivatives developed when as a teacher of a subject titled financial institution and markets. I realised that not much of a material is available in the academy domain with respect to commodity derivatives even though we have 2-3 multilevel commodity exchanges.

And lot of trading volume everyday lot of discussion debate happens in financial newspapers, but not many base schools are offering this one as a specific subject, so that is where I started learning little more on commodity derivatives and this book was published in the year 2014. And today when I was pasting this particular picture from the book, all of a sudden I realised that even if I have recorded almost more than 50 percent of this lecture series, I have not even once mentioned about this book to you all and umm, so I thought this is the time I should inform you all and this book covers almost all commodities which I am going to discuss during this 40 sessions of lecture. And of course what I am going to tell you is that academicians as academicians we are not very good at branding ourselves, so please do not take it as a exercise to exercise to make by book popular so that the book sells.

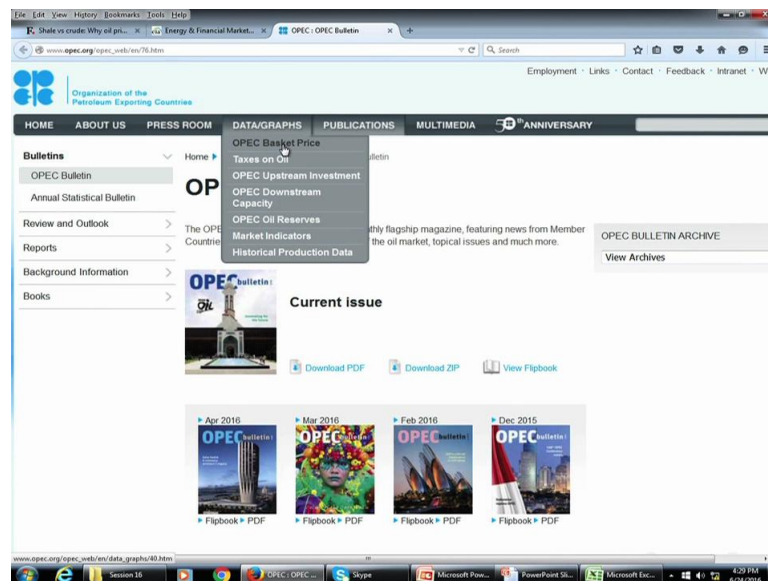
Of course I will be very happy if somebody takes it that way and because every time a book sells I get some royalty of course the royalty if I can say it in a financial terms or is peanuts but nevertheless, when a book sells I feel good because I feel that when somebody is buying that book, I am sure he or she is going to read the book and get some be more knowledgeable on commodity derivatives market.

Ok, with this ok and this we now talking about the book, one thing I would like to quote here. One of my colleague had mentioned once to me that in India you write book for the love of writing the book not for making money because simple economics comes into play, if the photo copying expenses are even marginally lower than the book cost, people will photocopy please do not start discussing about copyright violations and all that because this is not a forum for this discussion, so we know and everybody knows people do photocopy books, if not the whole book at least a major portion of the books are photocopied it it its it so let us go with the status quo and not debate or discuss whether it should be done or whether it should not be done.

So now continuing with our discussion on what are the factors which influence the crude oil price, so as I mentioned US dollar index is a significant factor which influences the crude price, so whenever US dollar index goes up WTI crude price goes down and both exhibits a negative correlation. And like any commodity, the available inventory at a given point of time is also has a influence on the spot price if inventory is substantially high or currently the

more amount of inventory is available for crude oil the it will have a impact on the crude oil price. Now when we are discussion about all these factors like supply, demand, financialization where do u if somebody wants to know more about crude oil, so which are the authentic sources of information from which he or she will be able to make or make out or find out good authentic information regarding the crude oil market.

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So this is of course this is a website, I just want you all to be aware of a monthly bulletin which is published by OPEC and this is the list of monthly bulletins and something interesting is also available if you see this dropdown list if it is visible to all of you, I hope it is visible to you. Yes, I have increased this, if you see this one this is your OPEC basket price, taxation oil, OPEC upstream investment OPEC downstream investment, OPEC oil reserves, OPEC sorry market indicators, historical production data, so this is one authentic source very reliable authentic source of getting to know what is happening in the in terms of production and in terms of new investment exploration activity in the major crude producing nations.

Another authentic source is your US Government energy information administration website, you also have Reuters, Bloomberg and plats and Argus, etc providing many discussions, many analysis about future direction of crude oil prices, so you can access to some of these websites and start in spending some time to learn what are the major factors which influences the crude oil price.

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## Crude Oil Contracts

- CME (Chicago Mercantile Exchanges)
- Both futures, regular options and Asian Options and many other variants trade at CME.
- Futures contract specification at CME
- Futures Contract Specification at MCX
- <https://www.mcxindia.com/market-data/market-watch>
- CME and MCX
- Hedging energy commodity price risk by Indian companies.
- The State of Airline Fuel Hedging and Risk Management in 2013- Mercatus Energy Advisors

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Now let us go to, we will discuss umm, we will discuss now what are the how this companies which are exposed to variation in crude oil price and a variation in refined product prices, how do they mitigate their risk. Of course many of these companies enter into OTC contracts so we will go and discuss this OTC contracts in detail, but we will also spend some time understanding various exchange traded derivative contracts.

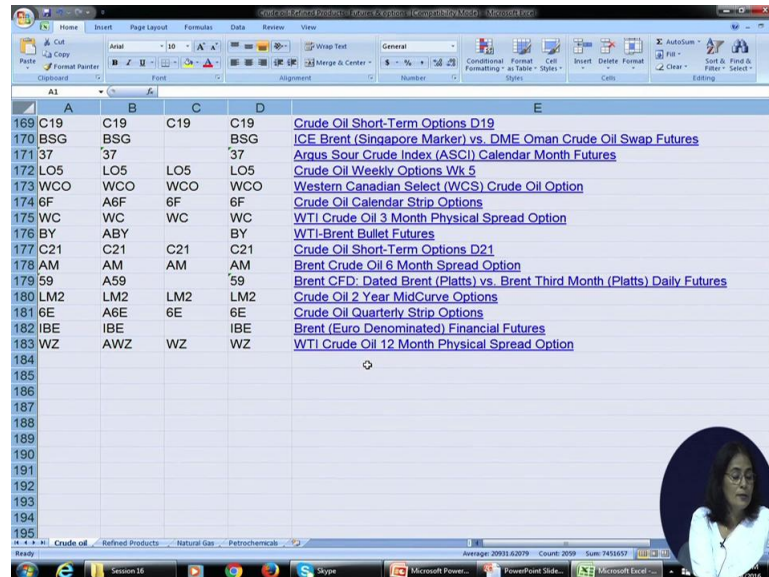
So now let us start with this is the link Chicago Mercantile Exchange. So in this Chicago Mercantile Exchange you have under the energy products you will be able to see 100 of derivative contracts which are listed, so I have just downloaded those uh, so let me, I hope you are able to see and let me increase the font size, so this is the this particular link shows.

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Product Code	Product Name
LO	Crude Oil Options
CL	Crude Oil Futures
WA	WTI Crude Oil 1 Month Calendar Spread Options
7A	Light Sweet Crude Oil (WTI) Financial 1
AO	WTI Average Price Options
BZ	Brent Last Day Financial Futures
CS	WTI Financial Futures
LC	Light Sweet Crude Oil European Financial Option
BK	WTI-Brent Financial Futures
BA	Brent Financial Average Price Options
WJ	LLS (Argus) vs. WTI Financial Futures
OS	Brent Last Day Financial Options
BZO	Brent Crude Oil Futures-Style Margin Option
FF	WTI Midland (Argus) vs. WTI Financial Futures
LPS	LOOP Crude Oil Storage Futures
E5	Argus LLS vs. WTI (Argus) Trade Month Futures
BV	WTI-Brent Crude Oil Spread Options
CY	Brent Financial Futures
BE	Brent Last Day Financial (European) Options
YX	Mars (Argus) vs. WTI Financial Futures
WCC	Canadian Heavy Crude Oil Index (Net Energy) Futures

I have just only downloaded the available contract, so you have crude oil options, you have crude oil futures, you have WTI crude oil one month calendar spread option, I mean it is mind boggling, it is unbelievable the number of contract, the variety of contracts which are available for trading at Chicago Mercantile Exchange.

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A	B	C	D	E
169 C19	C19	C19	C19	Crude Oil Short-Term Options D19
170 BSG	BSG	BSG	BSG	ICE Brent (Singapore Marker) vs. DME Oman Crude Oil Swap Futures
171 37	37	37	37	Argus Sour Crude Index (ASCI) Calendar Month Futures
172 LO5	LO5	LO5	LO5	Crude Oil Weekly Options Wk 5
173 WCO	WCO	WCO	WCO	Western Canadian Select (WCS) Crude Oil Option
174 6F	A6F	6F	6F	Crude Oil Calendar Strip Options
175 WC	WC	WC	WC	WTI Crude Oil 3 Month Physical Spread Option
176 BY	ABY	BY	BY	WTI-Brent Bullet Futures
177 C21	C21	C21	C21	Crude Oil Short-Term Options D21
178 AM	AM	AM	AM	Brent Crude Oil 6 Month Spread Option
179 59	A59	59	59	Brent CFD: Dated Brent (Platts) vs. Brent Third Month (Platts) Daily Futures
180 LM2	LM2	LM2	LM2	Crude Oil 2 Year MidCurve Options
181 6E	A6E	6E	6E	Crude Oil Quarterly Strip Options
182 IBE	IBE	IBE	IBE	Brent (Euro Denominated) Financial Futures
183 WZ	AWZ	WZ	WZ	WTI Crude Oil 12 Month Physical Spread Option

Normally we understand when we talk about derivative contracts the people who are starting with derivative understanding derivative contracts, they predominantly think derivative contracts is related to futures or options or at base spread contracts. But if you could just I just scroll through. If you see this particular link, crude oil has 183 different types of crude oil derivative contracts and this like you have crude oil calendar strip options, I mean the list is endless, so I am not going to spend more time on it and you if you are interested to learn more about this different varieties you have to spend considerable amount of time downloading the contract specification and who could be the user of this contract depending up on their commercial operations, so this is your crude oil contract.



	A	B	C	D	E	F
406	B7	AB7		B7	<a href="#">Gasoil 0.1 Carques CIF NWE (Platts) BALMO Futures</a>	Energy
407	MWL	MWL		MWL	<a href="#">Mini Japan C&amp;F Naphtha (Platts) vs. European Naphtha Carques CIF NWE (Platts)</a>	Energy
408	Y3	AY3		Y3	<a href="#">NY 2.2% Fuel Oil (Platts) Futures</a>	Energy
409	DZB	DZB		DZB	<a href="#">Singapore Gasoil (Platts) vs. DME Oman Crude Oil Swap Futures</a>	Energy
410	GKS	GKS		GKS	<a href="#">Gasoline 10 ppm FOB MED (Platts) Crack Spread Futures</a>	Energy
411	FC	FC	FC	FC	<a href="#">NY Harbor ULSD Calendar Spread Option - 3 Month</a>	Energy
412	7S	7S		7S	<a href="#">EuroBob Gasoline 10 ppm Barges FOB Rdam (Platts) BALMO Futures</a>	Energy
413	GP	AGP		GP	<a href="#">Gulf Coast Heating Oil (Platts) Futures</a>	Energy
414	ECB	ECB		ECB	<a href="#">European Naphtha Carques CIF NWE (Platts) BALMO Future</a>	Energy
415	23	23		23	<a href="#">NY Harbor ULSD Last Day Financial Futures</a>	Energy
416	US	AUS		US	<a href="#">Gulf Coast ULSD (Argus) Up-Down Futures</a>	Energy
417						
418						
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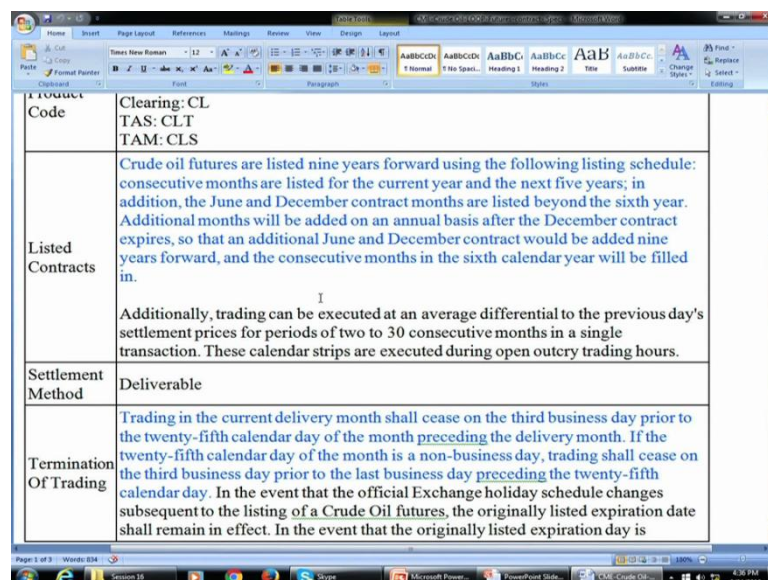
	A	B	C	D	E	F	G	H	I	J	K	L	M
					Mont Beheve Normal Butane (OPIS) Futures								
6	Clearing	Globex	Floor	Clearport	Product Name	Product Gb	Sub Group Category	Sub Categ	Cleared At	Exchange	Volume	Open Inter	
7	09	09	09	09	Mont Beheve LHD Propane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	6,880	151,663	
8	AD	AD	AD	AD	Mont Beheve Ethane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	256	71,719	
9	DO	DO	DO	DO	Mont Beheve Normal Butane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	1,811	31,930	
10	AN	AN	AN	AN	Propane from LHD Mont Beheve Ethane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	256	71,719	
11	AT	AT	AT	AT	Mont Beheve Ethane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	150	495	
12	10	10	10	10	Mont Beheve Ethane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	150	495	
13	BK	ADK	4H	BK	Conveyance Propane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	65	16,104	
14	CH	ADK	4H	CH	Mont Beheve Ethane (OPIS) Average Price Options	Energy	Petroleum NGL	Financial	Futures	NYMEX	80	2,734	
15	MIN	MIN	MIN	MIN	Mont Beheve Ethane (PCPI) Financial Futures	Energy	Petroleum Olefin	Financial	Futures	NYMEX	100	3,991	
16	HPE	HPE	HPE	HPE	Mont Beheve Ethane (PCPI) Financial Futures	Energy	Petroleum Olefin	Financial	Futures	NYMEX	260	7,750	
17	AI	AI	AI	AI	Mont Beheve Ethane (OPIS) Average Price Options	Energy	Petroleum NGL	Financial	Options	NYMEX	0	3,200	
18	MB	MB	MB	MB	Mont Beheve Normal Butane LHD (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	160	2,970	
19	AD	AD	AD	AD	Mont Beheve LHD Propane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	256	71,719	
20	7E	7E	7E	7E	Argus Propane Far East Index (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	118	2,843	
21	ADP	ADP	ADP	ADP	Argus Polymer Far East Index (OPIS) Financial Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	0	775	
22	B	AB	B	AB	Mont Beheve Normal Butane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	18	1,619	
23	PS	AB	PS	AB	European Propane CF of ASIA (Argus) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	101	1,588	
24	AD	AD	AD	AD	Mont Beheve Normal Butane (OPIS) BALMO Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	0	640	
25	9H	AN	9H	AN	Argus Propane (Saudi Arabia) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	105	1,195	
26	AD	AD	AD	AD	Propane from LHD Mont Beheve Ethane (OPIS) BALMO Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	0	640	
27	BL	ANL	BL	ANL	Crude Natural Gasoline (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	20	680	
28	CPR	CPR	CPR	CPR	Conveyance Propane (OPIS) Average Price Options	Energy	Petroleum NGL	Financial	Options	NYMEX	0	495	
29	AD	AD	AD	AD	91 Argus Propane Far East Index (OPIS) European Propane CF ASIA (Argus) Futures	Energy	Petroleum NGL	Financial	Options	NYMEX	0	495	
30	AD	AD	AD	AD	Mont Beheve Normal Butane (OPIS) BALMO Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	0	380	
31	MAAS	MAAS	MAAS	MAAS	Conveyance Normal Butane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	0	380	
32	MAE	MAE	MAE	MAE	Mini Argus Propane (Saudi Arabia) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	0	290	
33	MB	ANL	MB	ANL	Mont Beheve LHD to Butane (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	18	1,619	
34	BC	ANL	BC	ANL	Mont Beheve Propane Far East Index (OPIS) Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	130	1,619	
35	MB	ANL	MB	ANL	Mont Beheve Ethane (OPIS) BALMO Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	0	640	
36	MB	ANL	MB	ANL	Mont Beheve Ethane (PCPI) BALMO Futures	Energy	Petroleum Olefin	Financial	Futures	NYMEX	0	640	
37	AD	AD	AD	AD	Conveyance Propane (OPIS) Average Price Options	Energy	Petroleum NGL	Financial	Options	NYMEX	0	495	
38	AD	AD	AD	AD	22 Argus Propane Far East Index (PCPI) Financial Futures	Energy	Petroleum NGL	Financial	Futures	NYMEX	0	39	
39	HPE	HPE	4I	HPE	Mont Beheve Normal Butane (OPIS) Financial Futures	Energy	Petroleum Resin	Financial	Futures	NYMEX	0	28	
40	AD	AD	AD	AD	Mont Beheve Normal Butane (OPIS) Average Price Options	Energy	Petroleum NGL	Financial	Options	NYMEX	0	3,200	
41	MAR	MAR	MAR	MAR	Mini Far East Propane (Argus BALMO) Future	Energy	Petroleum NGL	Financial	Futures	CMED	0	0	
42	APR	APR	APR	APR	Mini Middle East Propane (Argus BALMO) Calendar Month Future	Energy	Petroleum NGL	Financial	Futures	CMED	0	0	
43	ADK	ADK	ADK	ADK	Mont Beheve Normal Butane (OPIS) Average Price Options	Energy	Petroleum NGL	Financial	Options	NYMEX	0	0	
44	PDF	PDF	PDF	PDF	Far East Propane (Argus) / European Propane CF ASIA (Argus) Spread BALMO Future	Energy	Petroleum NGL	Financial	Futures	CMED	0	0	
45	APR	APR	APR	APR	Mini Far East Propane (Argus) Calendar Month Future	Energy	Petroleum NGL	Financial	Futures	CMED	0	0	
46	3L	3L	3L	3L	Mont Beheve Physical In-to-Out (OPIS) Futures	Energy	Petroleum NGL	Physical	Futures	NYMEX	0	0	
					Normal Gas - 1 Petroleum								

So under the natural gas you have 298 contracts, of course this are all these contracts may not be trading with equal liquidity. So some contracts may be trading more, yes this is again petro

chemicals, petro chemical futures and option contract different combination of it you have, propane, ethane, butane and I mean there are different kinds of petro chemical contracts available, so this link this particular excel file.

Please note that I am not going to upload it, it will be I will be providing you link in the link in the PPT file and you please visit the CME exchange and go to the energy product and you will get to know the number of different types of this derivative contracts and if any specific contract you would like to more know more about, you have to go and download the contract specification. And each contract each derivative contract also has certain information pertaining to it available at the CME website and you can spend you can read more to understand more about that particular derivative contract.

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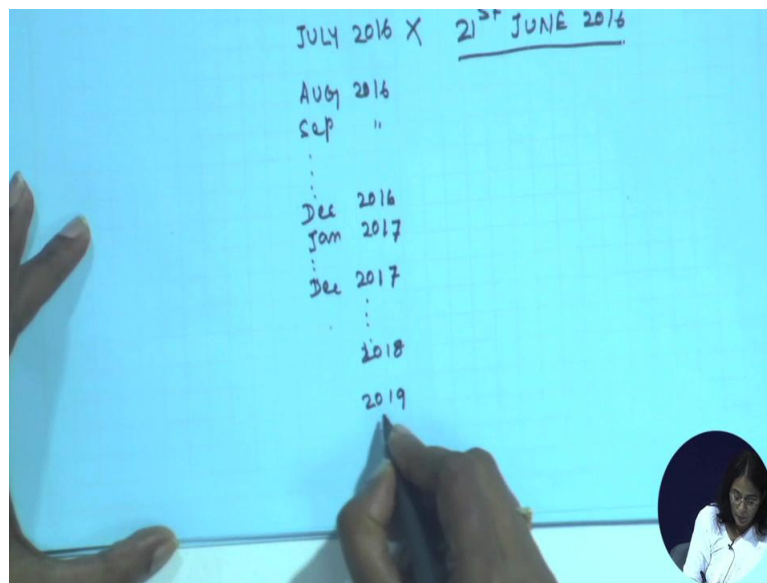
Clearing Code	Clearing: CL TAS: CLT TAM: CLS
Listed Contracts	Crude oil futures are listed nine years forward using the following listing schedule: consecutive months are listed for the current year and the next five years; in addition, the June and December contract months are listed beyond the sixth year. Additional months will be added on an annual basis after the December contract expires, so that an additional June and December contract would be added nine years forward, and the consecutive months in the sixth calendar year will be filled in.  Additionally, trading can be executed at an average differential to the previous day's settlement prices for periods of two to 30 consecutive months in a single transaction. These calendar strips are executed during open outcry trading hours.
Settlement Method	Deliverable
Termination Of Trading	Trading in the current delivery month shall cease on the third business day prior to the twenty-fifth calendar day of the month preceding the delivery month. If the twenty-fifth calendar day of the month is a non-business day, trading shall cease on the third business day prior to the last business day preceding the twenty-fifth calendar day. In the event that the official Exchange holiday schedule changes subsequent to the listing of a Crude Oil futures, the originally listed expiration date shall remain in effect. In the event that the originally listed expiration day is

Now let us go to understand little more on the futures contract which is on crude oil traded at CME, so please save this one, this is your crude oil future contract specification, contract unit is 1000 barrel, and this is what I would like all of you to let us spend some time, I hope it is visible to you, this one the listed contract so what are the listed contracts available. So if I can read out, crude oil futures contracts are listed 9 years forward using the following listing schedule, consecutive months are listed for the current year and the next 5 years, in addition June and December contract months are listed beyond the sixth year, so additional months will be added on annual basis after the December contract expires, so that an additional June and December contract would be added 9 years forward and consecutive months in the six calendar year will be filled in.



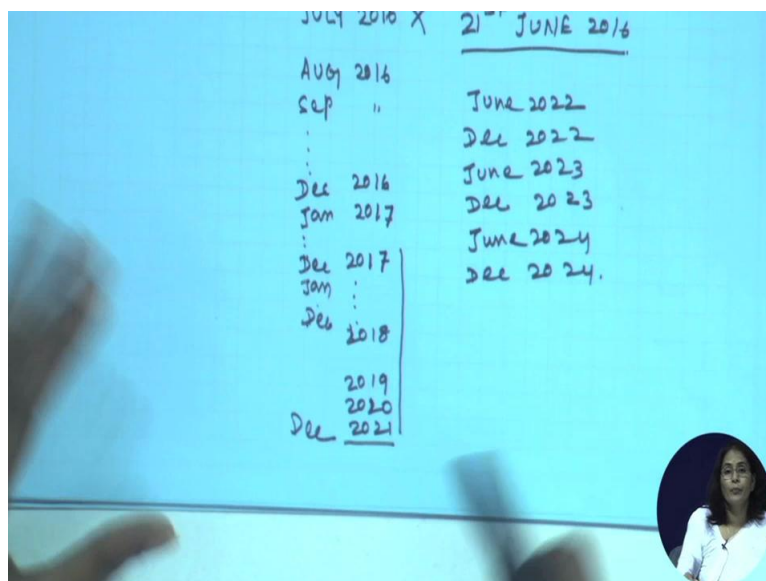
So going by that let us understand how exactly, so we are currently under June 2016 in fact to be precise today is 24<sup>th</sup> June 2016. Ok, before I go into this, I want you to focus little bit on this particular detail that is termination of trading. So when a trading for a given month ends, so trading in the current delivery month shall cease on the third business day prior to the 25<sup>th</sup> calendar day of the month preceding the delivery month. So let me repeat, trading in the current delivery month shall cease on third business day prior to the 25<sup>th</sup> calendar day of the month preceding the delivery month.

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With this let us start to understand more on the contract details, so we are, as I mentioned we are on 24<sup>th</sup> June 2016 today, so which will be the contract available, July contract 2016 contract will not be available because this July 2016 contract will be expiring on 21<sup>st</sup> June 2016. So July 2016 contract will not be available, but which contract will be available August 2016 contract, so September 2016 October, November, December 2016 contract will be available and what will be available, we will have similarly January 2017 contract will be available, will be December 2017 contract, similarly you will have all monthly contracts up to next 5 years, so we will have a 17, 18, 2018 contracts all serial months 18 contracts, 2019 contracts, so 2020, 2021, so all serial months contract for January to December will be available.

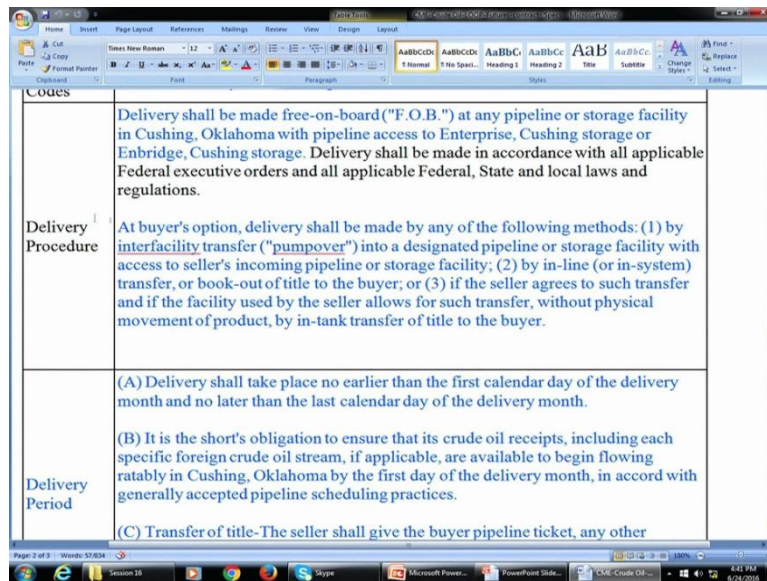
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JULY 2016 X	21 <sup>st</sup> JUNE 2016
AUG 2016	
SEP "	JUNE 2022
...	DEC 2022
DEC 2016	JUNE 2023
JAN 2017	DEC 2023
...	JUNE 2024
DEC 2017	DEC 2024
JAN ...	
DEC 2018	
...	
2019	
2020	
DEC 2021	

And also if you recall, subsequent to this we will have only June and December contracts will be available, so beyond December 2021 we will have June 2022 contract and December 2022 contract, June 2023 contract, December 2023 contract. So yes, so we will have December will be added 9 years, so you will have June 2024 contract and December 2024 contract. So at a given point time these many contracts will available for these many futures contract will be available for trading to a trader. Of course if there is not buying and selling interests some contracts may not trade, so we will take the real life data, real data which was I have downloaded from the Bloomberg database to find out how, what is the commodity forward cord for the crude oil that means how does this different contracts futures price of different contracts are compared to each other.

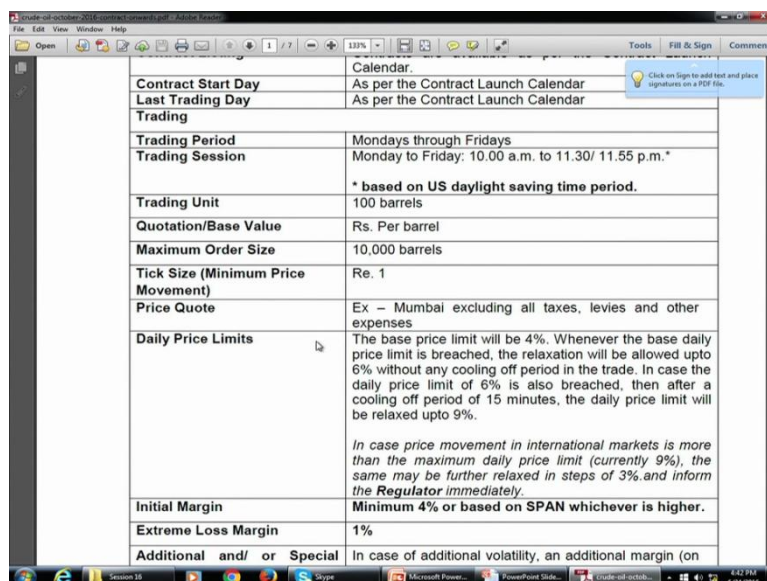
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Codes	Delivery shall be made free-on-board ("F.O.B.") at any pipeline or storage facility in Cushing, Oklahoma with pipeline access to Enterprise, Cushing storage or Enbridge, Cushing storage. Delivery shall be made in accordance with all applicable Federal executive orders and all applicable Federal, State and local laws and regulations.
Delivery Procedure	At buyer's option, delivery shall be made by any of the following methods: (1) by interfacility transfer ("pumpover") into a designated pipeline or storage facility with access to seller's incoming pipeline or storage facility; (2) by in-line (or in-system) transfer, or book-out of title to the buyer; or (3) if the seller agrees to such transfer and if the facility used by the seller allows for such transfer, without physical movement of product, by in-tank transfer of title to the buyer.
Delivery Period	<p>(A) Delivery shall take place no earlier than the first calendar day of the delivery month and no later than the last calendar day of the delivery month.</p> <p>(B) It is the short's obligation to ensure that its crude oil receipts, including each specific foreign crude oil stream, if applicable, are available to begin flowing ratably in Cushing, Oklahoma by the first day of the delivery month, in accord with generally accepted pipeline scheduling practices.</p> <p>(C) Transfer of title-The seller shall give the buyer pipeline ticket, any other</p>

Of course this is something which I thought of sharing with you who is a delivery procedure delivery procedure is at the buyers option and where the delivery will happen, the delivery will be if you see this one this part, the delivery shall be made free on board at any pipeline or storage facility in crushing Oklahoma with pipeline access to enterprise crushing storage or increase crushing storage, so the seller has to deliver the crude oil at crushing warehouses. And which is the delivery option, it is the buyer option so if the buyer wants to take delivery the seller has to deliver the underlying crude oil at a at the at this designated delivery location that which is crushing Oklahoma. Other details are there I am not going into it, we have already discussed this aspect in the earlier sessions.

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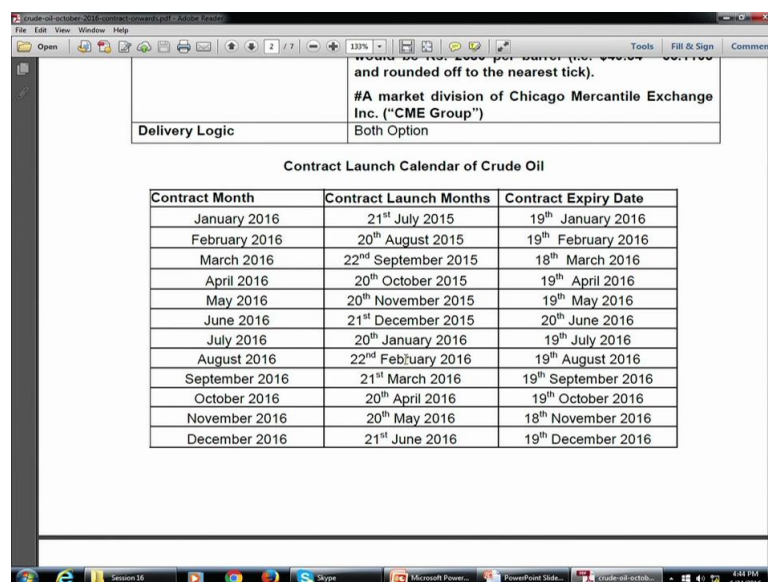


Contract Start Day	As per the Contract Launch Calendar
Last Trading Day	As per the Contract Launch Calendar
Trading	Calendar.
Trading Period	Mondays through Fridays
Trading Session	Monday to Friday: 10.00 a.m. to 11.30/ 11.55 p.m.*
Trading Unit	* based on US daylight saving time period. 100 barrels
Quotation/Base Value	Rs. Per barrel
Maximum Order Size	10,000 barrels
Tick Size (Minimum Price Movement)	Re. 1
Price Quote	Ex - Mumbai excluding all taxes, levies and other expenses
Daily Price Limits	<p>The base price limit will be 4%. Whenever the base daily price limit is breached, the relaxation will be allowed upto 6% without any cooling off period in the trade. In case the daily price limit of 6% is also breached, then after a cooling off period of 15 minutes, the daily price limit will be relaxed upto 9%.</p> <p><i>In case price movement in international markets is more than the maximum daily price limit (currently 9%), the same may be further relaxed in steps of 3% and inform the Regulator immediately.</i></p>
Initial Margin	Minimum 4% or based on SPAN whichever is higher.
Extreme Loss Margin	1%
Additional and/ or Special	In case of additional volatility, an additional margin (on

Now let us to go to future contract specification at MCX, of course what is a trading unit, you have thousand barrel and one thing I would like to share with you, where is the delivery if some buyers and sellers are interested to, if some buyer is interested to take delivery where he will take delivery of the underlying crude oil and it is at port installation at Mumbai, JNPT (Jawaharlal Nehru Port Trust) port, so at this location the seller has to deliver the crude oil. And what is the quality specification, quality specification is light sweet crude oil confirming to the API gravity between 37 degree to 42 degree and sulphur of 0.42%.

And also another aspect which I want all of you to focus on what is the due date rate or the price which will be considered for settlement of the contract on the contract expiry date, so that due date rate is the Indian price Indian rupee value of New York Mercantile Exchange crude oil current month contract multiplied by the RBI USD INR reference rate. So the rice prevailing WTI futures crude oil futures contract at NYMEX into NYMEX front month contract so the price prevailing of NYMEX crude oil front month contract of the last trading day of the M6 crude oil contract into the RBI multiplied by USD INR exchange rate as given by the RBI, so that is going to be the due date rate.

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Crude-oil-october-2016-contract-specifications.pdf

Delivery Logic

Both Option

Contract Launch Calendar of Crude Oil

Contract Month	Contract Launch Months	Contract Expiry Date
January 2016	21 <sup>st</sup> July 2015	19 <sup>th</sup> January 2016
February 2016	20 <sup>th</sup> August 2015	19 <sup>th</sup> February 2016
March 2016	22 <sup>nd</sup> September 2015	18 <sup>th</sup> March 2016
April 2016	20 <sup>th</sup> October 2015	19 <sup>th</sup> April 2016
May 2016	20 <sup>th</sup> November 2015	19 <sup>th</sup> May 2016
June 2016	21 <sup>st</sup> December 2015	20 <sup>th</sup> June 2016
July 2016	20 <sup>th</sup> January 2016	19 <sup>th</sup> July 2016
August 2016	22 <sup>nd</sup> February 2016	19 <sup>th</sup> August 2016
September 2016	21 <sup>st</sup> March 2016	19 <sup>th</sup> September 2016
October 2016	20 <sup>th</sup> April 2016	19 <sup>th</sup> October 2016
November 2016	20 <sup>th</sup> May 2016	18 <sup>th</sup> November 2016
December 2016	21 <sup>st</sup> June 2016	19 <sup>th</sup> December 2016

And who has a delivery option, delivery option is both options that is, buyer seller options are going to be matched and accordingly the delivery will be done. And let us go to the contract launch calendar, today we are on 24<sup>th</sup> June so which are the contracts which will be available, if you see I will be able to take I will not be able to take June 2016 contract because this June 2016 contract has expired on 20<sup>th</sup> June, so I can take July 2016 contract, August, September, October, November and December, yes December contracts is is available to me because this

contract started at on 21<sup>st</sup> June considering the fact that we are today on 24<sup>th</sup> June, so a trader will be able to buy or sell futures contract on July, August, September, October, November, December.

So when we compare the available futures contract to be to be traded in Indian exchanges, if you can see compare that one with the CME or NYMEX contract it is much lesser in duration, in fact only 6 month up to a period of 6 month into the future a trader in India will be able to take exposure, while in case of a CME crude oil futures contract it can go up to maximum 9 years period.

So with this I would like to end our discussion on what factors discussion on today's session. We will continue with remaining part of the crude oil in the next session, so to summarise what we discussed today, we discussed what factors influence the crude oil price and we also briefly discussed about my book and the third part which we discussed is the variety of derivative contracts which are available at Chicago Mercantile Exchange for crude oil and all other derivative products from the crude oil that is eating oil, contracts if gasoline contracts, diesel contracts, petro chemical contracts and we also understood the contract specification of crude oil futures contract available at CME and multi commodity exchange respectively.

So this with this, this session comes to an end, we will continue with understanding about the futures price prevailing at CME in our next session, thank you all of you.