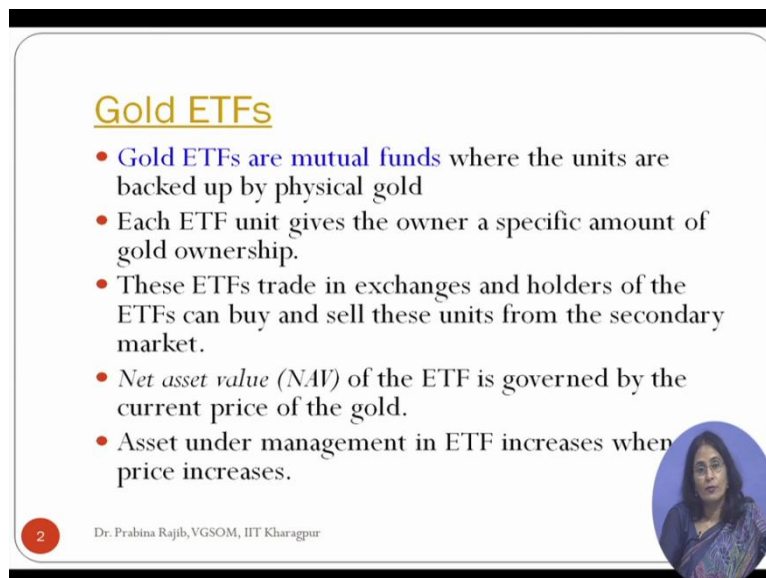


Commodity Derivatives and Risk Management
Professor Prabina Rajib
Vinod Gupta School of Management
Indian Institute of Technology Kharagpur
Lecture 29
LBMA Gold Spot Price and Gold Derivatives

Okay Hi all let us continue with our discussion on gold and we if you recall in the session we discussed a little bit about who are the major consumers of the gold. I discussed about the central banks and investors, retail investors, individuals who have interest in buying gold jewelry as well as buying gold coins and gold bars.

You have industry and India specifically lot of temples and trust are owners of the gold, so lot of people donate gold and in this context, I also mentioned about lord Vishnu's gold idol which was weighing around 32 kg and showed you the picture of that and we also discussed, I also briefly mentioned about how gold ETF are one of the gold ETFs have contributed to the demand for the gold so briefly let us discuss what is the ETF and if you do not have much of a knowledge about the ETF, I will advise you to go to a national stock exchange website or any other website where they have information pertaining to ETFs.

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Gold ETFs

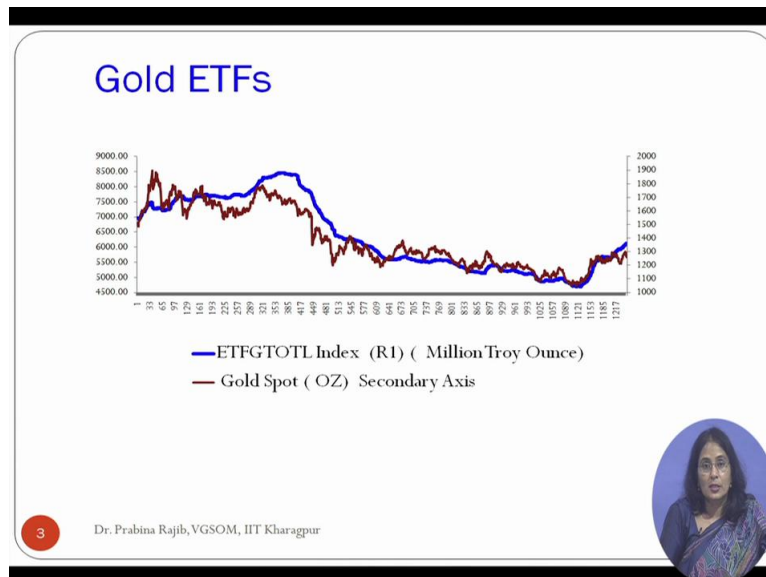
- Gold ETFs are mutual funds where the units are backed up by physical gold
- Each ETF unit gives the owner a specific amount of gold ownership.
- These ETFs trade in exchanges and holders of the ETFs can buy and sell these units from the secondary market.
- Net asset value (NAV) of the ETF is governed by the current price of the gold.
- Asset under management in ETF increases when price increases.

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But this much I can tell today that ETFs are nothing but mutual funds. In regular mutual funds, you have underlying investment can be equity or bonds or combination of equity as well as bonds in case of a gold ETFs the underlying asset is gold. So as I mentioned, gold ETFs are mutual funds and these units of these mutual funds are backed by physical gold and every unit, ETF unit gives the owner some specific amount of the gold and ETFs can be ETFs

are normally listed in stock exchanges. And these ETFs are traded in stock exchanges based on the net asset value and it has got a relationship with the gold price so whenever the gold price increases, the asset under management that is the amount of gold held by these ETFs increase so there is a direct correlation between ETF investment in gold and gold price.

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This particular picture shows this relationship. If you see, this is the red line shows the gold price and this blue line shows the investment in all ETFs in terms of troy ounce, million troy ounce so if you see, there is a positive relationship between these 2 figures and though it is not available at this point of time, simple excel calculation shows correlation to be 0.94 and this information, I have downloaded from the Bloomberg database so what is this ETF, GT, GT total index so this consists of all asset under management for all ETFs which are listed and traded in major exchanges all over the world.

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Spot Price of Gold

- Fixed by London Bullion Market Association (LBMA).
- History of London as major trading center for precious metal : <http://www.lbma.org.uk/history>
- Given for 1 TROY ounce = 31.1035 gram
- Fixed twice daily (10:30 am and 3 pm)
- 5 member committee
 - The Bank of Nova Scotia – Scotia Mocatta,
 - HSBC,
 - Deutsche Bank AG London,
 - Societe Generale Corporate and Investment Banking
 - Barclays Capital.



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Now, let us go to little bit on how does the spot price is arrived at. See, if we go to a local jeweler, we get to see some price in fact if you go today, you get to see something Rs. 27450, next day you go, you may end up seeing around Rs. 27920 so and so forth, so how does where does this how what factors influence or who quotes this price. So one thing here, I would like to mention here even if we see a price variation in these shops, India has nothing to do with price setting, India is a price taker so gold price gets decided at LBMA that is your London Bullion Markets Association so LBMA sets the price of the gold in US dollar, Euro and pound sterling.

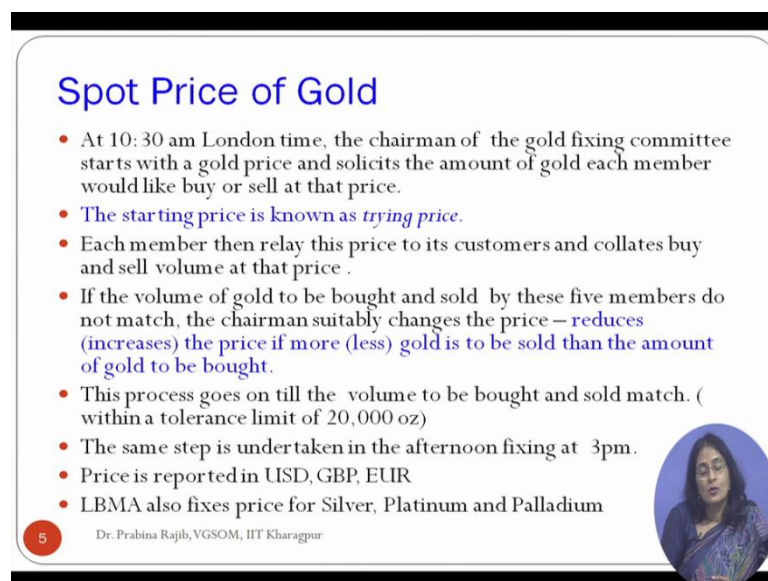
And this dollar price and all these prices gets relayed to all over the world and this price multiplied by the exchange rate becomes the price of the gold prevailing for that given day and this price gets get by LBMA twice a day, so the probably if you go to a big jeweler, the price which is prevailing in the morning would be different than the price which is prevailing in the afternoon. Though mostly in Indian jewelers show only one price but in international jewelry houses, you can have two prices displayed on a given day. Now this London Bullion Market Association not only fixes the price for the gold, it also fixes the price of silver, palladium and platinum. However, today, gold being our focus we will be discussing more about the price fixation aspect of the gold and the same process is undertaken for price fixation of silver and palladium and platinum.

Now, if the importance of gold importance of London in gold market, it is just lot of historical events behind it and London gained importance for major trading for the gold and London Bullion Market Association is setting the price for gold from I think around some

1600 something. Please visit this LBMA website for history so that you get to know about the history of price fixation by LBMA. And when we talk about the word ounce, it is equivalent to 31\$1035 gram so when we are hearing that gold is around dollar 1200 per ounce so that is equal to 31\$1035 gram. And in India mostly prices are quoted as per the 10 grams so what we get to see mostly in the shops or newspaper publication is with respect to 10 gram or a tola.

And as I mentioned spot gold price gets fixed twice daily that is morning fix and afternoon fix and let us first understand how exactly the fix is arrived at so it is nothing but you now LBMA collecting quotations from buyers and seller and matching it and try to identify a price in which the maximum amount of buying and selling can be done. So this LBMA has a 5 member committee. Who are these 5 members, it is listed here. Bank of Nova Scotia, HSBC, Deutsche Bank of London, Societe Generale and Barclays Capital, so these 5 members so how exactly this spot price fixing is done so this spot price fixing is done.

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Spot Price of Gold

- At 10:30 am London time, the chairman of the gold fixing committee starts with a gold price and solicits the amount of gold each member would like buy or sell at that price.
- The starting price is known as *trying price*.
- Each member then relay this price to its customers and collates buy and sell volume at that price.
- If the volume of gold to be bought and sold by these five members do not match, the chairman suitably changes the price – *reduces (increases) the price if more (less) gold is to be sold than the amount of gold to be bought*.
- This process goes on till the volume to be bought and sold match. (within a tolerance limit of 20,000 oz)
- The same step is undertaken in the afternoon fixing at 3pm.
- Price is reported in USD, GBP, EUR
- LBMA also fixes price for Silver, Platinum and Palladium

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So this spot price fixing is done, morning fix is done at 10:30 AM so at 10:30 AM London time, the chairman of the gold fixing committee so this whoever is the chairman, he starts with calling he starts with by giving a price. Let us say he quotes around 1300 dollar, so with this 1300 dollar or this 1300 dollar will be known as a trying price. This starting price is known as the trying price so at dollar 1300, all these 5 members will get starting getting in touch with their own clients who are banks are big jewelry producing mining sorry, gold mining companies, banks and gold mining companies who are the members of these 5 banks. These banks will be collating their buy and sell order at this 1300 US dollar per ounce price


and this amount of buy and sell will be relayed to the chairman and if the buy and sell order is within 2000 ounces then that price will be fixed for the day.

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Exercise

- The chairman of gold fixing committee quotes a price of USD 1278 per ounce. The members relay these to their customers and received the following buy and sell order.
- Comment a) Find out the sell minus buy volume and comment whether each member is a buyer or a seller? b) Whether the chairman would reduce/increase the price in the next round? c) Everything else remaining constant, if the sell volume for Societe Generale changes to 79928 ounces of gold, then what would the chairman do?

Name	Buy Volume (in ounces)	Sell Volume (in ounces)	Sell-Buy Volume (in ounces)
Bank of Nova Scotia	80091	81075	984 (sell)
HSBC	37639	40907	3268 (sell)
Deutsche Bank	27000	18075	-8925 (buy)
Societe Generale	85230	69928	-15302 (buy)
Barclays Capital	41262	38298	-2964 (buy)



Then let us take this example, let us say the chairman of gold fixing committee quotes a price of 1278 US dollar and this price gets relayed to the clients by the members so these 5 member team, they relay this price to or they inform this price to their clients, so the clients start giving buy and sell orders so each of these 5 banks start collating the buy and sell order and let us say as given in this particular table, at dollar this 1278 dollar US dollar price, Bank of Nova Scotia clients gave 80091 ounces for buy and what is the sell volume, 81075 ounces. So if you see similarly HSBC, their clients gave different buy, sell so Deutsche Bank, Societe Generale and Barclays Capital.

Now, let us say what is the net volume or how much Bank of Nova Scotia is going to inform to the chairman, chairman of the fixing committee. Bank of Nova Scotia will the net volume, that is 984 sell volume will be informed by the Nova Scotia. HSBC will accordingly inform 3268 ounces of sell volume, but Deutsche Bank will inform 8925 as buy volume. 15302 ounces will be informed as a buy volume of Societe Generale and 2964 will be the buy volume of Barclays capital. Now, sum total of the sell volume which is 984 plus 3268, it is coming to around 4200 something so that is the total of the sell volume and what is the total of the buy volume, total of buy volume is around if you sum to all all these 3 buy volumes we add up, it is coming around 27000 something around 27000.

Now, the difference between sell and buy is more than 20000 ounces in that case, this 1278 will not be the fixing price. The sell volume is less than the buy volume, so what the chairman will do? Chairman will reduce the price or increase the price? There are more amount to be sorry there are more amount to be bought as compared to the more amount to be sold, so the chairman will be increasing the price and again announce a higher price and this price again will be relayed by these members to their clients and different set of buy and sell volume will be collected and collated and this process will go till the buy and sell volume difference is within 20000 ounce.

So once this limit is reached, the chairman will be stopping the process of finding out the price and that becomes whatever price arrived at, that becomes the price for the morning fix. The same process will be repeated in the afternoon and the same process is also done for silver palladium and platinum.

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LBMA gold price fix		
Date	Gold Price (Am Fix)	Gold Price (Pm Fix)
24-Jun-16	1313.85	1315.5
23-Jun-16	1265.75	1262.15
22-Jun-16	1265	1264.85
21-Jun-16	1280.8	1272.6
20-Jun-16	1283.25	1281.8
17-Jun-16	1284.5	1290.7

- Investors Are Flocking To Gold And Other Safe Havens After Brexit Vote

In response to the turmoil, investors pushed the price of gold up more than 4% to \$1,315 per ounce on Friday. Shares of gold mining companies like Newmont Mining (+5.09%) Barrick Gold and Yamana Gold were also up about 4% each.
- http://www.lbma.org.uk/assets/Forecast_2016_Interactive.pdf

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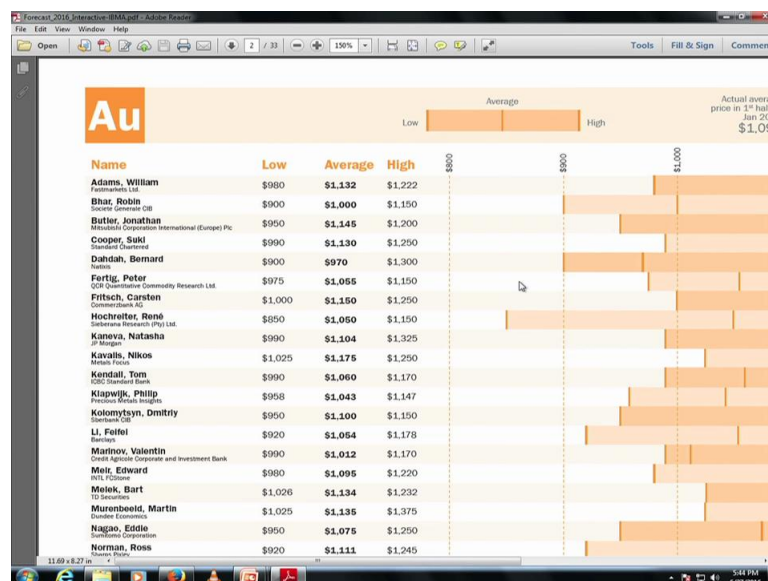
Let us go to this particular table, if you see London gold price fix, which is at AM fix and PM fix for last 5 days. And if you see morning fix for different days is morning and afternoon is given and one interesting observation I want all of you to note here, on 23rd June, the morning and afternoon fix is around 1260 ounces 60 US dollar per ounce. However on 24 June, if you see, within a 1 day, there is around 35 plus 13 so 48 dollar of price change that is delta of 48 dollar. And what is the reason, the Brexit announcement was made on 24th June and so a if you recall gold is a self haven asset or whenever economy is in a you now not performing well or there is uncertainty with respect to the performance of economy or whatever is

happening in the economy, most people flock the gold and it is very clearly obviously visible from the price difference within a given day.

This data again, I have taken from LBMA website and if you see in this investors are flocking to gold and other safe haven asset after the Brexit vote and not only the gold price has gone up, the shares of gold mining companies have also gone up significantly. So this information is this link provides this particular document you can you can read in detail if you are interested.

And also, every year, LBMA conducts a survey to know what is going to be the fuse of or what is the direction of a gold price, gold, silver, platinum price for the year to come. So the survey is normally conducted in the month of January and the survey reports are made available where important big players in the gold and silver, palladium, platinum industry are asked regarding this views and the interesting fact is that none of them said in the month of January that gold price is going to be going up to dollar 1300. So I will just take couple of minutes to show you more about this particular PDF this particular document.

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Please see this one so if you see this is your AU, these are if you can I hope you are able to see this. You have your gold Adam Williams of First Market Limited, he has predicted gold price is maximum gold price is going to be 1222 with minimum of 980 and average of 1132 so different people have different from different banks and investment companies, they have been asked to give their views with respect to the gold and if you see the average is lowest is 978, average is 1103 and maximum is 1231. So none of the these none of the people could or

could foresee what is going to happen post Brexit and gold price increased to hovering around 1365 sorry from 1265, it has gone up to 1313.

Similarly, other for silver is also there is similar kind of a prediction and platinum and palladium. And please note that I am going to make this particular information available to you all. The link is available if you are interested, you can download this particular document because this document is not supposed to be freely circulated by the people who are downloading it. Now, let us go to our understanding on the relationship between gold spot and forward and futures price. So the same cash and carry arbitrage is applicable to the gold forward and futures price relationship. Let us take an example how gold futures price work so let us go to this slide which is the information given in the PPT.

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Gold Spot – Forward/Futures price

- A gold producer would like sell gold at a later date. The forward price can be calculated as
 - Borrow gold at spot date
 - Agree to pay interest for borrowing gold (gold lease rate)
 - Sell gold in the spot market
 - Invest sales proceed at the prevailing interest rate
- **Example:**
 - Gold spot rate = USD 1313 per oz,
 - Gold lease rate = 0.75% per annum,
 - Prevailing interest rate in (LIBOR-USD) = 1.20% per annum
 - maturity period = 6 month
- **Theoretical futures/forward price = $1313 * e^{rt}$ = USD 1318**

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Let us say a gold producer would like to sell gold at a later date. What is the gold mining company's fear? The fear is that price is going to go down. May be at this point of time some of you may be thinking this is not a right fear but let us say if we go back to the 1990s, this is was a very real fear that gold price remained around at 300 dollar per ounce and it progressively went down, at time it had gone up gone down to even 455 dollar during 1994-95. Now, let us say the gold producer has a fear of gold price going down so it wants to enter into a forward contract and the price at which it should bid so what should be the forward contract price or futures contract price so let us take an example here.

So what the gold producer or gold mining company can do, it can borrow gold at spot date so today's price, it can borrow gold and agree to pay interest for borrowing gold so whatever the

gold borrowing rate, it will agree to pay. It is denominated in rupee or dollar terms but it is much lesser than the interest rate, so if you go and if you want to go and take a loan from a bank, the rate at which you will borrow probably will be much lesser than if you if a particular company goes and borrows gold from a body which is willing to lend gold. Let us say a Central Bank which is holding gold that Central Bank can lend gold to somebody and the rate which the Central Bank will be charging will be a gold lease rate. So this producer borrows gold at on a spot date, pays the leasing rate, simultaneously sells the gold in the spot market and makes a fix deposit from the sale proceeds.

So what is going to be the future price at a later point of time? Let us take the numerical example mentioned here. So gold spot rate is let us say 1313 per ounce, gold lease rate is let us say 0.075% per annum and prevailing interest rate, that is your LIBOR US dollar rate which is 1.20% per annum. If some of you are not aware of what is LIBOR rate, that is LIBOR stands for London Interbank Offered Rate, so please go to the appropriate website and find out how LIBOR is calculated so basically LIBOR is a interest rate. LIBOR is calculated in many currencies so we are taking the LIBOR 12 month interest rate denominated in US dollar, so that is your 1.20% per annum. Maturity is 6 months so if you take this one, the theoretical futures price theoretical future or forward price is equivalent to 1318 so 6 months from now, the companies would be willing to or today companies would be willing to enter into a futures or forward contract at a price of dollar 1318 per ounce.

So as long as you have the prevailing interest rate more than gold lease rate so the if the as and when the or as long as the interest rate prevailing interest is more than the gold lease rate, the theoretical forward or future price is going to be more than the spot price and the market is going to be in Contango. That is, spot price is going to be less than the future price so in case of gold, the market is supposed to be a Contango. So spot price is going to be less than future price and far month future price should be higher than the near month futures price, or let me put it other way around that is near month future price is going to be more than the spot price and far month future price is going to be more than the near month futures price.

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	A	B	C	D	E	F	G	H	I	J
91	Oct-98	295.93								
92	Nov-98	294.12								
93	Dec-98	291.68								
94	Jan-99	287.08								
95	Feb-99	287.33								
96	Mar-99	285.96								
97	Apr-99	282.62								
98	May-99	276.44								
99	Jun-99	261.31								
100	Jul-99	256.08								
101	Aug-99	256.69								
102	Sep-99	264.74								
103	Oct-99	310.72								
104	Nov-99	293.18								
105	Dec-99	283.07								
106	Jan-00	284.32								
107	Feb-00	299.86								
108	Mar-00	286.39								

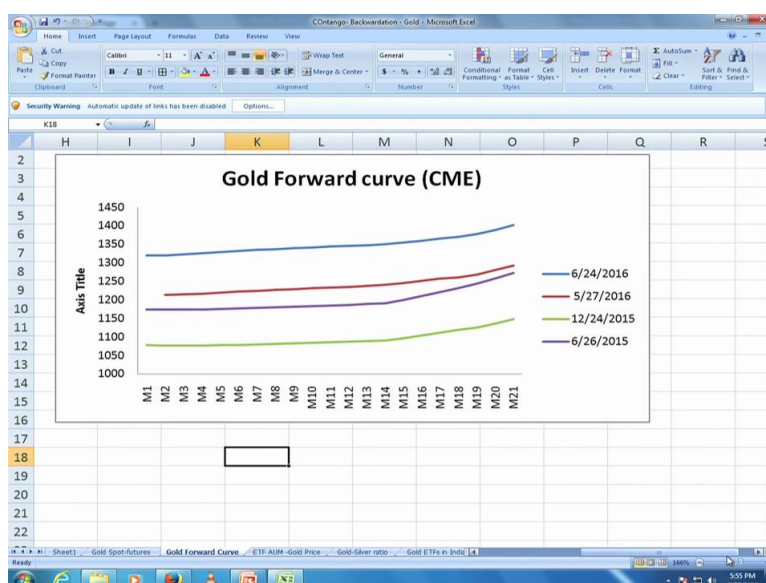
Now, let us I have downloaded some data from Bloomberg so quickly I will just show you or briefly we will discuss this aspect so what are the information which I have downloaded, if you see this aspect I have already shown it to you. It is the movement of gold price per ounce, spot gold price per ounce and if you see around July 99, it, July, June July 99, it was hovering around dollar 250 so let me make it a little bigger so that you are able to see. June July it was hovering around 256 around May, it was around 356 so and it remained within below 300 label for substantial number of years, so it is around 2002 it remained less than dollar 300 and progressively it increased and it reached 1778\$95 per ounce in the year September 2011. And it has from to from a peak of this value; it has come down around 1260 for dollar during May 2016.

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Date	GOLDS Comdty	GC2 Comdty (M2)	Basis with M2	
6/24/2016	1315.45	1322.4	-6.95	contango
6/23/2016	1256.84	1263.1	-6.26	contango
6/22/2016	1266.32	1270	-3.68	contango
6/21/2016	1268.11	1272.5	-4.39	contango
6/20/2016	1290.06	1292.1	-2.04	contango
6/17/2016	1299	1294.8	4.2	backwardation
6/16/2016	1278.46	1298.4	-19.94	contango
6/15/2016	1291.75	1288.3	3.45	backwardation
6/14/2016	1285.76	1288.1	-2.34	contango
6/13/2016	1283.86	1286.9	-3.04	contango
6/10/2016	1273.92	1275.9	-1.98	contango
6/9/2016	1269.74	1272.7	-2.96	contango
6/8/2016	1262.78	1262.3	0.48	backwardation
6/7/2016	1243.9	1247	-3.1	contango
6/6/2016	1245.3	1247.4	-2.1	contango
6/3/2016	1244.2	1242.9	1.3	backwardation
6/2/2016	1210.95	1212.6	-1.65	contango
6/1/2016	1212.98	1214.7	-1.72	contango
5/31/2016	1215.33	1217.5	-2.17	contango
5/27/2016	1212.95	1216.7	-3.75	contango
5/26/2016	1219.8	1222.7	-2.9	contango
5/25/2016	1224.47	1226.6	-2.13	contango

So I just also did some Contango backwardation calculation and I said that gold should not exhibit gold should always have a Contango structure but the actual data shows that it is Contango as well as backwardation and there was lot of debate and discussion going in the media, the reasons for the backwardation and the reasons sighted are the negative interest rate, uncertainty regarding the future economy and future global economy and huge demand from Chinese people to hold a gold in the current form, so the so basically strong demand in the spot market has resulted in spot prices increasing at a higher rate as compared to the futures price.

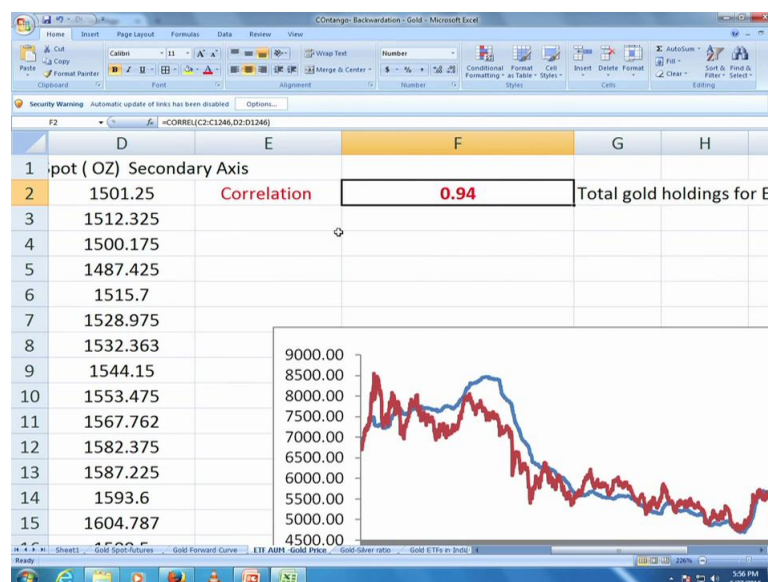
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Now let us go to the gold forward curve so what is this gold forward curve is the price movement of different maturity curve so this is I have just randomly chosen 4 days so let me increase this size. Let us focus on this particular picture so this gold forward curve, randomly, I have taken so the last date which I have considered, it is 24th June. On 24th June, this shows a Contango, almost all these days it shows a Contango structure.

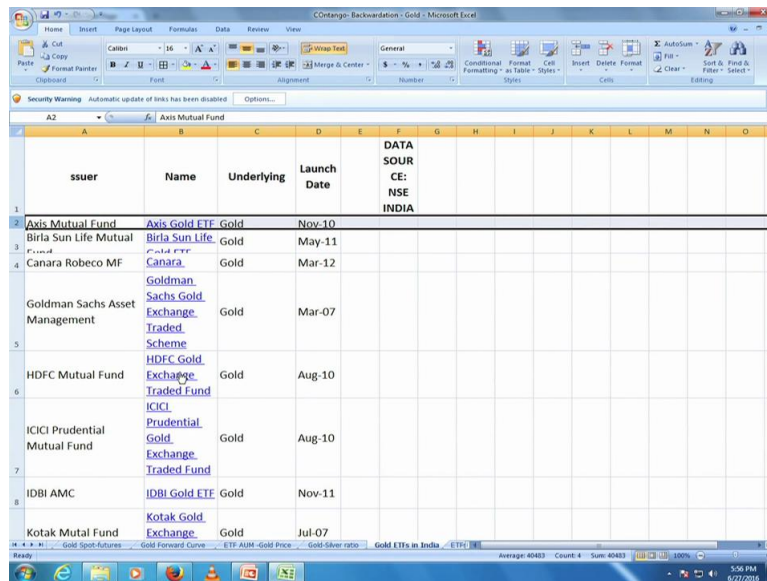
In fact the backwardation, gold backwardation or gold futures price being less than the spot price has happened only at the near month contract that is the near month contract are lesser than the spot prices but as we have moved into the far month contract, they are more than the spot price. So this particular picture does not have the spot price incorporated to it and this shows let us consider this particular 24th June price so M1 price shows the contract maturing and July, August so and so forth, it has gone up to M21.

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And this picture, I have already shown it to you, the relationship between of ounces of a ETFs with respect to the gold price and this is what I was mentioning the correlation of 0\$94. So let me make it bigger so this gold ETF and gold ETF investment and the gold price which has got a positive correlation of 0\$94.

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Issuer	Name	Underlying	Launch Date	DATA SOURCE: NSE INDIA
Axis Mutual Fund	Axis Gold ETF	Gold	Nov-10	
Birla Sun Life Mutual Fund	Birla Sun Life Gold	Gold	May-11	
Canara Robeco MF	Canara Gold	Gold	Mar-12	
Goldman Sachs Asset Management	Goldman Sachs Gold Exchange Traded Scheme	Gold	Mar-07	
HDFC Mutual Fund	HDFC Gold Exchange Traded Fund	Gold	Aug-10	
ICICI Prudential Mutual Fund	ICICI Prudential Gold Exchange Traded Fund	Gold	Aug-10	
IDBI AMC	IDBI Gold ETF	Gold	Nov-11	
Kotak Mutual Fund	Kotak Gold Exchange	Gold	Jul-07	

And when it comes to gold ETF in India, we have substantial number of gold ETFs available, listed at National Stock Exchange so which are the which are the ETFs so you have Axis Mutual fund, Axis Gold, HDFC Mutual Fund so and so forth, so you if you are interested to see what are the structures of these ETFs and all, more information pertaining to these gold ETFs you can go to National Stock Exchange website and spend some time.

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Derivatives Contracts on Gold (Indian Exchanges)

- Many futures contracts: For example, MCX has Gold (1 kg), Gold (Mini), Gold (Guinea) Gold (petal)
- Maximum maturity is for 12 months
- FSP/DDR is based on polled price at Ahmedabad or futures price at a international exchange multiplied by RBI reference rate.
- Good Delivery List
- Indian Gold Quanto Futures at DGCX
- Quanto is a type of derivative in which the underlying is denominated in one currency, but the instrument itself is settled in another currency
- This contract enables investors to gain exposure to the Indian gold and rupee market without being exposed to movements in the USD-INR exchange rate.



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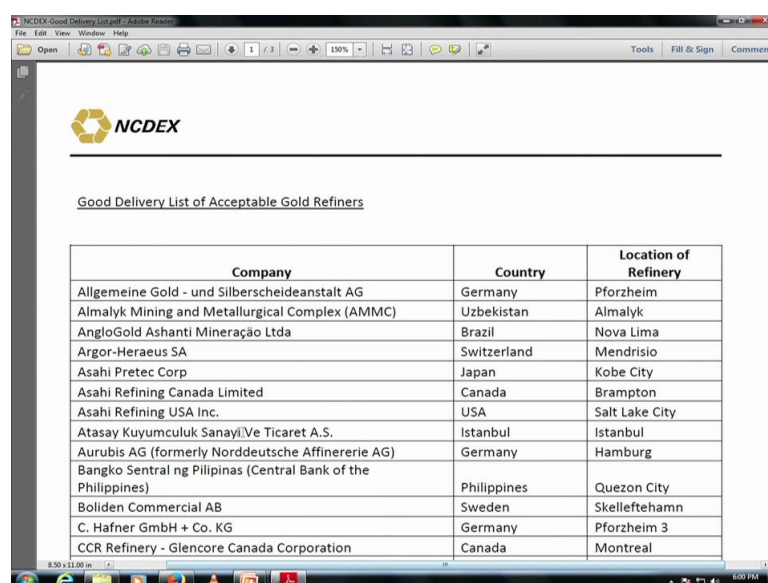
So this aspect, we have already discussed. Now, let us quickly go to the derivative contracts on gold and in India, in Indian exchanges, many predominantly gold futures contracts trade in terms of various lot sizes. So you have MCX Gold has gold futures it has 1 kg it has got Gold Mini, which has got 10 gram underlying, Gold Guinea has 8 gram as your underlying, gold

petal has 1 gram as underlying. And maximum maturity is for 12 months, this is one of the largest longest duration contracts available.

Most of the agri commodity and energy commodity can have 6 to 8, max 6 to 8 months into the future, you can take futures position but for gold you have a maturity running into 12 month and the final settlement price of due date rate price is calculated based on the pole price at Ahmadabad or futures price at international some international exchanges multiplied by the RBI reference rate and good delivery list, this is something which is I thought of discussing a little bit. Remember in case of a crude oil or in case of let us say soybean or any other agri commodity, the sellers will be taking the commodity, putting it in the exchange approved warehouse, the warehouse will have some quality certifier and assurer who will see the test the quality of the underlying and will certify whether the underlying goods are as per the contract specification of the exchange.

But in case of gold, this does not happen. No exchange takes the ownership of certifying the quality of the gold to be delivered. What they do, they identify some of the refiners whose gold they will be accepting as the delivery, so the responsibility of delivering quality gold lies with the refiner and the exchanges do not have the in fact the exchanges do not have the infrastructure or capacity to test the quality of the gold because testing, quality testing can be quite expensive. It requires different kind of infrastructure so no exchange all over the world takes that responsibility.

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The screenshot shows a web browser window displaying the NCDEX website. The page title is 'NCDEX-Good Delivery List.pdf'. The NCDEX logo is visible at the top. Below the logo, the text 'Good Delivery List of Acceptable Gold Refiners' is displayed. A table with three columns: 'Company', 'Country', and 'Location of Refinery' is shown. The table lists 15 gold refiners from various countries including Germany, Uzbekistan, Brazil, Switzerland, Japan, Canada, USA, Turkey, Germany, Philippines, Sweden, and Canada.

Company	Country	Location of Refinery
Allgemeine Gold - und Silberscheideanstalt AG	Germany	Pforzheim
Almalyk Mining and Metallurgical Complex (AMMC)	Uzbekistan	Almalyk
AngloGold Ashanti Mineração Ltda	Brazil	Nova Lima
Argor-Heraeus SA	Switzerland	Mendrisio
Asahi Pretec Corp	Japan	Kobe City
Asahi Refining Canada Limited	Canada	Brampton
Asahi Refining USA Inc.	USA	Salt Lake City
Atasay Kuyumculuk Sanayi Ve Ticaret A.S.	Istanbul	Istanbul
Aurubis AG (formerly Norddeutsche Affinerie AG)	Germany	Hamburg
Bangko Sentral ng Pilipinas (Central Bank of the Philippines)	Philippines	Quezon City
Boliden Commercial AB	Sweden	Skelleftehamn
C. Hafner GmbH + Co. KG	Germany	Pforzheim 3
CCR Refinery - Glencore Canada Corporation	Canada	Montreal

Now let us go to the good delivery list so as per the NCDEX, which are the good delivery list refiners. So these are if you can see it runs into how many it runs into 2 and half pages so substantial number of refiner name and is given so let us take like Boliden Commercial AB so this is the Sweden and the location of the refinery, I am sorry I am having difficulty pronouncing this Scaleleft okay, so this particular refinery so refinery of this Boliden Commercial AB can be gold bar coins produced at this refinery can be delivered at the NCDEX platform.

Interestingly only one refinery in India certifies that. That is your MMTC PAMP India Private Limited, this refinery is in Mewat. So with this we will come to an end on discussion on the second session on gold and we will be resuming with the remaining part of the gold in our third and final session so thanking all of you and we will be continuing with our discussion from the good delivery list aspect, so looking forward to meeting you all in the next session.