Commodity Derivatives and Risk Management

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Lecture 36
Gold and Other Precious Metal Derivatives

Welcome to the 36th lecture on Commodity Derivatives and Risk Management. And today we are going to discuss gold and other precious metal derivatives which is related to silver, platinum and palladium. However, for today's session as well as the coming 2 or 3 sessions we will predominantly be focusing on gold as a precious metal and very briefly we will be touching upon the discussion related to silver, platinum and palladium. Now, let us understand what is the relevance of gold in our life. And gold is considered as the most important position of human being as the history of mankind goes. And before we go into the discussion related to gold pricing and derivative contraction gold, let us briefly understand the history of gold. In fact, this is going to set the tone for many of the current initiatives being taken with respect to gold as an investment. Historically gold was initially used for jewelry as well as for making idols for worshipping and later around 1500 BC gold emerged as a medium of exchange in the form of gold coin. In fact, earlier recorded gold coin is known as a shekel which was weighing around 11.3 grams, and it was being traded in the ancient Egypt. Now, subsequently we had other countries coming out with gold coins which has popularly known as Florin and Ducat, and they were used for international trade over the time period these coins started getting acceptance and people were exchanging these coins as a medium of exchange in the any international trade. This is again copies of two Ducats which I have taken from this link which is mentioned in this picture. And this as this report, this picture shows that these ducats were printed in the year 1513. And from the gold coin being traded as a medium of exchange over time gold standard became the system of monetary system and by 1900 many countries had adopted the gold standard. And what do we mean by the gold standard? In gold standard the fiat currency or the paper money was based on the fixed quantity of gold and any individual whoever is holding some paper money, or a fiat currency can go to a bank and exchange the same money for a fixed amount of gold. And money supply in an economy was also directly tied to the supply of gold and this is the essence of countries which were following gold standard as a monetary system. However, during world war I which lasted from 1914 to 1980 many countries temporarily moved away from the gold standard as they wanted to print money to pay for the military expenses. Please note that the gold standard requires that a country's government will be able to print more paper money or fiat money only if the country has a access to higher amount of gold. So, without having the gold the countries were getting restrained to print additional paper money. So, during this world war I many countries abandoned the policy of gold standard. And subsequently during the great depression period which lasted from 1929 to 1939 during that period of time stock market in USA and UK crashed. And with the crashing of the stock market, people started losing faith in the fiat money. And what they did at that point of time is that they started withdrawing money from the bank and started buying and hoarding gold. And many banks failed there was a bank run because,

When every investor is every fixed deposit holder is withdrawing money from a bank no bank will be able to sustain that kind of a bank run. So, at that point in time many banks failed. So, to entice depositors not to withdraw paper money many banks increase the interest rate thus increasing the cost of borrowing. So, on the one hand when the banks were increasing the interest rate so that people will not be withdrawing the money that has got a negative ramification by increasing the cost of borrowing by the companies. So, in 1944 at Bretton Woods agreement the gold standard of monetary system came to an end and countries started maintaining their currency with respect to US dollar. However, even though the monetary the gold standard of monetary system is not prevalent or not applicable, but gold still remains as a strategic asset for countries as well as individuals. Now, let us understand a little bit about the supply and demand of the gold. This particular table which I have directly taken from this website which is www.gold.org. So, this particular website provides the total supply and demand for the gold and as you can see for the year 2022 total gold supply is to the tune of 4779.2 metric tons. And this gold supply has come from three sources predominantly the mine production gold is always mined from underground mines. So, the major production of gold happens from the mine site that is your mine production. And also, another thing which I want to pay attention is that the total mine supply for a given year is not equal to the total mine production. Mine production is the actual gold which has been mined by the companies, but mine supply considers some considers another component which is your net producer hedging. So, total mine supply is equal to total mine production plus the net producer hedging. So, now let us understand what we mean by a producer hedging. This producer hedging is the additional supply of gold, by gold mining companies due to the hedging activity. All of us know that whenever there is a decline in gold price gold mining companies will incur loss. So, to mitigate that kind of loss many times gold mining companies enter into hedging activity. And when the hedge comes to an end in terms of the hedging contract expiring the gold mining company is supposed to deliver the gold as part of the forward sales, gold loans or gold option positions. So, if a particular company gold mining company has entered into forward sales sometime back and at a later point in time during the expiry of the forward contract the gold mining company is supposed to deliver the gold. So, that is related to that delivery amount we call it a producer hedging supply due to producer hedging. So, as part of this hedging activity gold producing companies release gold from the existing stocks. And many a times gold producing companies also dehedge by closing the existing hedge positions. So, hedging religious additional gold stock to the market dehedging exactly does the reverse. So, when we are talking about the producer hedging or more specifically net producer hedging that net producer hedging can be positive or negative as you can see in this quarter 1, quarter 2, quarter 3, quarter 4. In the first 2 quarters the net producer hedging is positive that means, gold mining company will be delivering gold as part of the hedging activity. And when the net producer hedging is negative that means, the gold mining companies have closing have closed this hedged position. Hence this amount of gold will not be available because of the de hedging of the gold. So, to summarize net producer hedging can be positive or negative. So, mine production plus the net producers hedging gives us the total mine supply. In addition to the total mine supply, a lot of recycled gold also comes to the supply. So, recycled gold in terms of old jewelry getting converted into coins and gold bars. So, many of us know we tender gold jewelry and get cash, or we tender gold jewelry and buy new pieces of jewelry. So, those gold jewelry gets recycled in the form of coins and bars and join the supply side of the gold. So, gold supply side has 3 components which is clearly explained in this particular table. Now let us understand who or how this gold demands or which sources the gold demand comes from. So, gold demand comes from couple of sectors which is a jewelry is the predominant sector and industrial uses that is your medical, electronic, automotive, electronics and aerospace industries are major use of gold and in addition to that bars and coins for investment purpose. And I am sure you must be knowing some of your family members or some of your acquaintances may be investing bars and coins not in the form of gold jewelry, but in the form of bars and coins and predominantly holding those bars and coins for investment purpose. So, jewelry demand constitutes about 57 percent of the total demand and followed by industry uses. Another source of gold demand comes from exchange traded funds, or we call these ETFs. So, ETFs are nothing, but mutual funds in a typical let us say an equity mutual fund the fund manager collects money from us and creates a portfolio of company shares and generate returns from those portfolio of return shares and the fund manager transfers those returns to the investors of mutual funds. And gold ETFs are nothing but mutual funds, but they invest only in gold. Now the exact working of a gold ETF how ETF units are created how what is the return of ETFs we will be discussing subsequently, but a major portion of the gold demand is coming from the ETFs and people are investing in ETFs because they are expecting that gold price is going to go up instead of buying gold in the form of jewelry or buying gold in the form of bar and coin they are investing in exchange traded funds. Now, another major demand for gold also comes from a central bank like our Reserve Bank of India, collectively central banks have around 32000 tons of gold. So, this particular table shows the top countries having more than 1000 tons as a strategic reserve. As you can see United States have the maximum amount of gold reserve which is about 8133.46 tons followed by Germany, Italy and so on so forth. And this table also shows this gold reserve as a percentage of total reserve. As you can see the gold is 68.69 percent of the total reserve maintained by the central bank of a given country. Let us take example of a China, in case of China, China has about 2068 tons of gold, but that merely constitute 3.9 percent of the total reserve of the bank. Now, one may ask why central banks would invest in gold. In fact, for the same reason individuals invest in gold, for the same similar reason or the same reason central banks invest in gold. The sentiment related to gold investment is very aptly summarized by a Dutch central banker. He mentions that a bar of gold always keeps its value crisis or not that gives a safe feeling and the gold holdings of a central bank are, therefore, a beacon of confidence. So, whenever any central bank is having a higher amount of gold that kind of a gives a confidence to the world at large that this there is nothing going to happen to this particular country because the country is having significant amount of gold and if necessity arises that the central bank will be able to pledge or sell the gold to temporarily tide over the difficult position. Now, let us understand what is the other aspects of the central bank and gold holding and over the period of time central banks have become the net buyers of the gold. As you can see that this particular table which shows the Singapore Central Bank, China Central Bank, Turkey and Indian Central Bank that is the Reserve Bank of India have become the net buyer of the gold during 2022. Similarly, some other country central banks such as Russia, Cambodia, Uzbekistan and Kazakhstan these are the country central banks who have been the net seller of the gold. But as you can see from the graph the total quantum of gold bought by some of the central banks is much higher than the total quantum of the gold sold by some of the central banks. In fact, central banks of many countries entered into an agreement called CBGA that is Central Bank Gold Agreement, and this agreement was initially done in the year 1999 for a period of 5 years and subsequently those agreements were renewed in 2004, 2009 and 2014 and every time the duration was for 5 years. And what was the objective of this CBGA? The objective of the CBGA is that the member countries or country reserve bank of a country central banks which are signatory to the CBGA, they will not be selling a large chunk of gold because if one central bank sells large chunk of gold and it depresses the price it also affects the other central banks because other central banks are also holding a significant amount of gold. And in 2019 this central bank gold agreement was not renewed. In fact, the necessity for such an agreement was not felt because even though since 1999 gold price has increased 4 to 5 times central banks have remained the net buyers of the gold. So, not only they have not sold they have accumulated the gold over a period of time. So, that is probably the reason behind that CBGA is not relevant anymore. In this context, please note that Reserve Bank of India bought about 100 tons of gold during the last 2 financial year and out of this 100 tons of gold RBI keeps about 437 tons of gold with the Bank of England and Bank of International Settlement overseas. So, the gold bullion reserve is not physically kept within India a large portion about 437 tons kept outside and Reserve Bank of India maintains about 300 tons of gold within domestically mostly all this gold are stored in underground vaults. In this context it is also very important to know a very interesting trivia related to the USA bullion depository. In the USA bullion depository, which is popularly known as Fort Knox, this particular facility houses 8,000 tons of gold at a single location. I do not think any other country has a single physical location where they have kept all the gold all gold reserve, but Fort Knox was created specifically to store the gold and there are lot of interesting YouTube video related to how this Fort Knox is built, how the Fort Knox has absolutely unbelievable world class security arrangement, how the key to the Fort Knox is with 7 people and who are the 7 people they do not know each other even the president of USA does not have a access to the Fort Knox. So, many interesting aspects related to Fort Knox are available in these YouTube videos. So, you may watch some of these YouTube videos to get a more understanding about the USA bullion depository. And as I mentioned just now most of the central banks other than the USA central bank keep gold in underground vaults and the same is distributed across other banks and many other geographic locations. Hence as you can see that not only individual people like you and me invest in gold as a strategic asset the importance of gold as a strategic asset can never be undermined because country government also are investing in gold. Now, with this background let us understand a very historical and very important event in the life of India which is the Reserve Bank of India's gold pledge in the year 1991. In the year 1991 India government was facing a severe balance of payment crisis India was hardly exporting anything and India was importing many items. So, India did not have enough foreign currency reserve even to pay for the crucial purchase like crude oil for 2 weeks. And to tide over this balance of payment crisis India government that is Reserve Bank of India placed 47 tons of official India's official gold reserve as a collateral security with Bank of England and Bank of Japan and raised about 405 million of 405 million US dollar to pay for essential imports including the crude oil. In fact, at that point in time world at large did not have much of a confidence on the Indian government. So, at that point in time because the Bank of England did not have a confidence that the government of India will be able to return this 405 million of placed amount that point in time Bank of England agreed to provide the loan with the condition that the place gold must be kept outside India. And even though government of India or RBI negotiated very frantically that it is not possible to lift 47 tons of gold so, quickly to some other country location, but Bank of England kind of insisted on the same and the government of India had to airlift 47 tons of gold. In fact, there is a very interesting event that happened during this period of time this particular quote unquote I have taken from these economic times article. So, it seems the van in which the gold was being transported from RBI to the airport had a tire burst on the way to the airport and the moment of vehicle stopped about half a dozen armed guards jumped out and formed a circle around the van and many interesting trivia associated with this particular event you can read on the internet. In fact, the placing of 47 ton gold to get foreign currency to import some essential items was a very important event in the life of Indian economy and that particular placing of the gold hurt the national sentiment and there is a massive public outcry against the within government. And in the economic history of India, placing of gold to get foreign currency is a major watershed moment and that led to the liberalization and the privatization initiative in 1991 which benefit we are able to see that India has progressed significantly in the economic terms since 1991 and much that much positive whatever we are able to see now can be contributed can be traced to the this privatization and liberalization initiative which started in the year 1991. In this context that is an interesting article available at the economic times. So, the title heading is when 47 tons of gold was in the middle of the road. So, you can read about this particular interesting event in this weblink. Now, let us understand the relevance of gold as an asset. So, we have kind of a discussion that yes central banks are investing in gold. Now, let us go much beyond just sharing certain numbers to understand how gold is a very important and a relevant asset. In fact, the great JP Morgan who is the legendary investment banker of USA once stated that gold is money and everything else is credit. Now, in this context now let us understand is really gold money and what are the properties of money and let us check whether gold has those properties which is required for something to be called as a money. Please note that something will be called as a money if it is treated or if it has a store of value. But so, what is the meaning of store of value? So, if one holds some money, he or she will be able to buy any other goods either today, tomorrow or maybe sometime later. So, if somebody is holding something and by holding that something that particular person will be able to buy other goods and services then it will be called as a money. And of course, money is not a perfect store of value as inflation reduces purchasing power. So, if anything will be called a store of value if any person will be able to utilize that particular asset to buy other items and that particular item will also be having a property of store of value. Now, the second property is called money as a medium of exchange. So, something will be called as a money if it is treated as a medium exchange, and it is widely accepted as a method of payment. So, let me repeat, something will be treated as a medium of exchange if it is widely accepted as a method of payment. And the third property of money is that money is unit of account and money is used as a common yard stick to measure the value of goods and services and other transactions. So, anything we buy today we negotiate we want to sell all this is denominated in some currency terms. So, in that case that currency is known as your unit of account. Also the fourth important feature of money is that money has to be divisible or fungible. So, what is the meaning of divisibility? Divisibility features require that money to be divided into smaller units. For example, if somebody is holding 500 rupees note today, he or she can take that note to a bank or any other shop will be able to get let us say 501-rupee coin. So, that is the divisibility feature and if I wish I will be able to exchange a higher denomination currency to a lower denomination currency or vice versa. And also, the fungibility indicates that the smaller units and larger units are mutually interchangeable. So, basically if I am holding a 50 rupee note and somebody comes and gives me a 510 rupee note I have no problem in taking those 510 rupees note in exchange for 50 rupee note. So, that feature is known as fungibility. Now, let us check whether gold is really money and whether gold has these attributes or these properties. In fact, if you think that except the first property of store of value gold does not satisfy other properties. Gold is no longer a medium of exchange, gold is not in a is a not a unit of account and of course, gold is not divisible or fungible in a in a true sense. So, except the first property of store of value gold does not satisfy other properties. However, gold opts as a store of value only when gold provides a hedge against inflation. Even though gold is considered as a store of value it will be really treated as a store of value only if gold provides a hedge against inflation. So, what is the meaning of hedge against inflation? So, gold return to be higher than the inflation rate. If we are saying that gold is a hedge against inflation which is a requirement for a property of store of value, then gold returns should be higher than the inflation rate. Now, let us understand what is the meaning of what is the meaning of hedge against inflation. Please note this particular detail which is given in this table is a very hypothetical number, these are not real numbers. Let us say I have taken 8 months of data for gold price in rupee terms for 10 gram of gold and the corresponding month of CPI. CPI stands for your consumer price index. So, the CPI index values I have taken, and CPI value has a base value of 100. So, these are the CPI values for different months. So, based on these two data I have calculated the gold return as well as the CPI return. And as you can see that gold will be a hedge against inflation if gold return is higher than the CPI return. So, the last column shows the inflation adjusted gold return. So, as you can see inflation adjusted gold return for the first or second month is negative while for other months is a low of 0.38 percent to 4.41 percent. So, except for the first month of 1.55 percent rest of the month gold is having a gold return is higher than the inflation returns. So, in that case we will be able to see that gold is providing a hedge against inflation. Please note that many research studies have found that gold does not provide hedge against inflation always this relationship that always gold return will be higher than the CPI return does not hold true on every month-on-month basis in every country, but sufficiently long period of time this particular property holds true. So, many researchers have done empirical data analysis and have contributed or have found that gold does provide hedge against inflation over a sufficiently long period of time. So, going by this property gold has only one important property, that is the store of value, the rest of the property does not hold true, at least in today’s context. So, with this we will come to today’s session on gold and introduction various aspect of the gold historical basis of gold and also gold supply gold demand aspect and whether gold can be treated as a money or not. So, with this we will be ending today's session, and we will be continuing with the remaining part of the discussion related to gold and other precious metals in the next session. So, again I eagerly look forward to interacting with all of you in the next session.