

Summary of selected commodities

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1. Introduction

In the course commodity trading several presentations are being held by students about selected financial commodities. This paper will summarize all the presentations into one paper. Further it will not just be a summarization of the presentations; it will also try to give deeper and further insight into the world of commodities. The idea is that students can take something with them after the course is finished. This paper will give them basic information about important commodities which are traded throughout the world. The information for this summary will be taken from the students' presentations; if not, it will be cited. Every commodity will be separated into three chapters. In an overview there will be some basic information about the commodity and in the second chapter the value chain of the commodity will be explained. The value chain has four dimensions as we have learned in the course commodity trading. These are: exploration, transport, refinery, storage. In the last part there will be shown special graphs which are related to trading and help to deepen the understanding of each commodity.

2. Brent crude

2.1 Overview

Brent Crude Oil is the biggest category of crude oil. The four big categories are:

- Brent Crude Oil
- WTI (West Texas Intermediate)
- Dubai Crude
- OPEC Reference Basket

The Brent Crude Oil consisting Brent Crude, Brent Sweet Light Crude, Oseberg, Ekofisk and Forties. It is sourced from the North Sea and used to price two thirds of the world's internationally traded crude oil supplies. The WTI is lighter than Brent Crude Oil that means that it is better quality and therefore it should be priced higher.

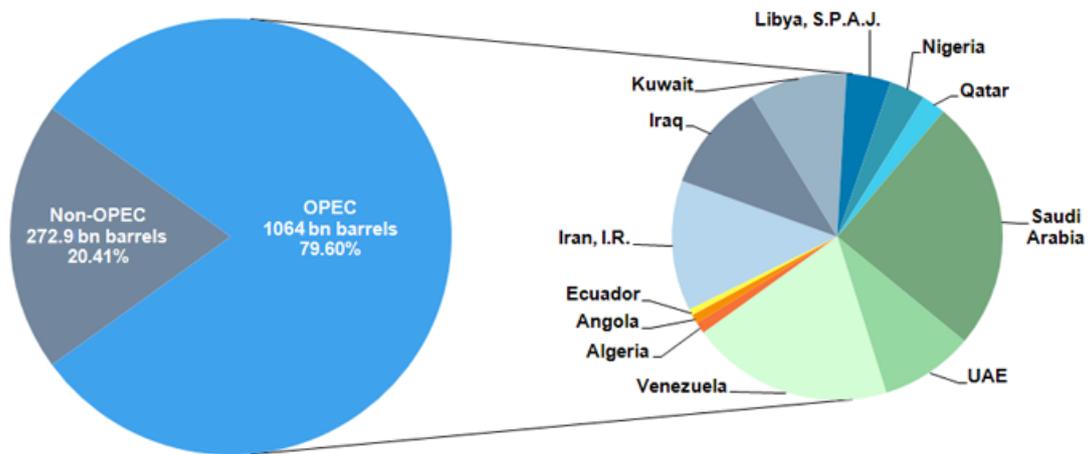
2.2 Value Chain

The value chain consist exploration, production, transportation, refining and marketing which I will describe closer. The oil gets located under the surface with various techniques such as seismology. After that the oil gets pumped to the surface and is enhanced with several recovery techniques. The transportation is done by pipeline, barges and big tankers (e.g. 25'000 tons) which are also used as storage. The refining process is very complex: trough chemical reactions and physical separations various products arise from crude oil such as: gasoline, kerosene, diesel fuel, asphalt and many others. In the end of the process there is competition between branded and unbranded stations which bring the fuel to the people.

2.3 Important Graphs



OPEC Share of World Crude Oil Reserves 2009



OPEC proven crude oil reserves , end 2009
(billion barrels)

Saudi Arabia	264.59	24.9%	Iraq	115.00	10.8%	Libya, S.P.A.J.	46.42	4.4%	Algeria	12.20	1.1%
Venezuela	211.17	19.8%	Kuwait	101.50	9.5%	Nigeria	37.20	3.5%	Angola	9.50	0.9%
Iran, I.R.	137.01	12.9%	UAE	97.80	9.2%	Qatar	25.38	2.4%	Ecuador	6.51	0.6%

Source: OPEC Annual Statistical Bulletin 2009

3. Gold

3.1 Overview

Gold is primarily used for store of value, industry and religion. As of today a total of 165,000 tones (2009) have been mined in the human history this equivalent to a cube with 20.4 meter on a side. This fact shows that the gold price reflects the value the people have about gold and not because it's rare.

3.2 Value Chain

Gold extraction is most economical in large, easily mined deposits. Since 1880 South Africa has been the source for a large proportion of the worlds gold supply, with about 50% of all gold ever produced coming from South Africa. Gold gets refined also out of other precious metals like Copper, Nickel etc. The Transport of Gold is mainly done by ship, lorry or train.

3.3 Quality

Karat	Quantity of Gold in the Alloy	Trading Name	% of Atoms
24 kt.	999	Pure Gold 999	100
22 kt	916 2/3	Gold 916	83
20 kt	833 1/3	Gold 833	68
18 kt	750	Gold 750	50
14 kt	583 1/3	Gold 585	38
10 kt	416 2/3	Gold 417	23
9 kt	375	Gold 375	20
8 kt	333 1/3	Gold 333	18

3.4 Markets/Politics

There are many reasons why people and even governments hold gold as an investment and use them for portfolio diversification:

- Returns are not correlated with many assets
- Sources of demand for gold are diverse (both geographically and sectorally)
- Most Spending on gold is discretionary: (not one of the indispensable commodities)

Years: 2004-2009

63% jewelry sector

25% investment

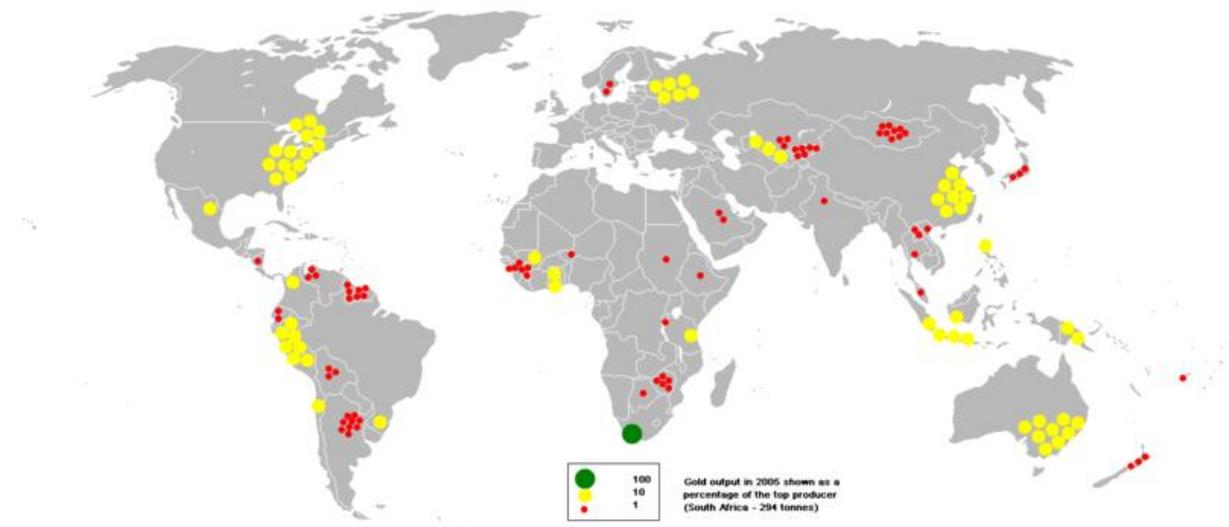
12% technology

- Gold is particularly important in **asset allocation**. Majority of investment strategies focus primarily on only a few asset classes – stocks, bonds and cash. More effective diversification can be achieved by incorporating alternative investments, such as commodities. While traditional diversifiers often fail during times of market instability, even a small allocation to gold can significantly improve the consistency of portfolio performance. Particularly appealing to many investors is the fact that this protection applies during both **stable** and **unstable** financial periods.

With gold there are many investment vehicles:

- Coins and small bars (in EU exempt from VAT)
- Bullion coins
- ETFs
- Futures and options
- Warrants
- Gold accounts (electronic currencies)
- Gold Accumulation Plans
- Gold mining stocks
- Gold certificates
- Structured products

3.5 Important Graphs



4. Emission certificate EUA

4.1 EU Emission Trading System

The EU Emission Trading System (EU ETS) is the largest multi-national emission trading scheme in the world. It was launched 2005 and is a major pillar of EU climate policy. Here are some basic dates about the EU ETS:

- The EU ETS was created to reduce emissions in the EU to meet the reduction targets set by the Kyoto protocol.
- EU ETS is the largest multinational cap and trade scheme and accounts for almost 50% of the CO₂ and 40% of the greenhouse gas emissions in the EU.
- One EU-Allowance (EUA) is needed to compensate one ton of CO₂. It's the trading unit.
- The EUAs are initially allocated according to the National Allowance Plans (NAP) in each country to the companies taking part in the trading scheme.
- The EUAs are allocated by the grandfathering principle (according to historical emissions)
- For the current Phase II, the reduction targets are around 7 percent below the 2005 emissions. Additionally emissions can be offset with CERs up to 13.4% of the total emissions; CERs are not further covered by our presentation.
- Participants in the EU ETS return emission credits (EUA & CER) equal to the amount of their emissions during the year.
- Trading period of several years to avoid annual irregularities like extreme weather conditions etc.
- Phase I: 2005-2007, Phase II: 2008-2012, Phase III: 2013-2020

4.2 Trading Phase I & II

Preis



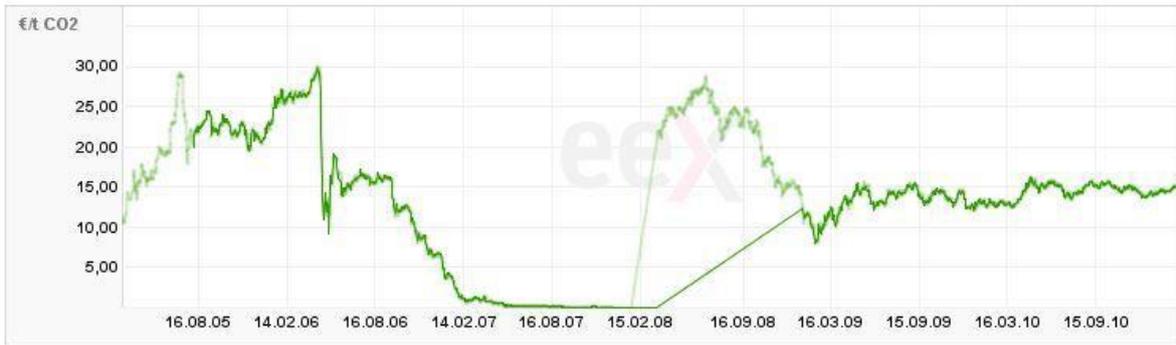
Volumen



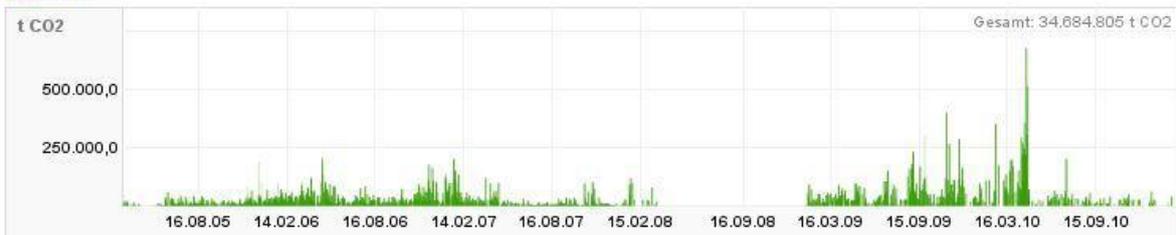
Legende



Preis



Volumen



Legende



4.3 Phase III

- Kyoto protocol which was the fundament for the reduction target is not yet renewed.
- New reduction targets between 20% to 30% below 1990 levels. Linear reduction by 1.74% per annum.

- The Aircraft industry and further greenhouse gases will be included in the system.
- The EUAs will be allocated in terms of best available technology, meaning that the benchmark is the best available technology and not the historical emissions.
- First allocation via auctions, with exceptions for strong export oriented companies and power plants.

5. Aluminum

5.1 Overview

Aluminium (UK) or aluminum (US) is a silvery white member of the boron group of chemical elements. It has the symbol **Al** and its atomic number is 13. It is not soluble in water under normal circumstances. Aluminum is the most abundant metal in the Earth's crust, and the third most abundant element, after oxygen and silicon. It makes up about 8% by weight of the Earth's solid surface. Aluminum is too reactive chemically to occur in nature as a free metal. Instead, it is found combined in over 270 different minerals. The chief source of aluminum is bauxite ore.¹ Some key facts:

- 2nd most used metal after steel
- Flexible, like steel but lighter
- Good conductor
- Plentiful
- Lots of energy used in production.

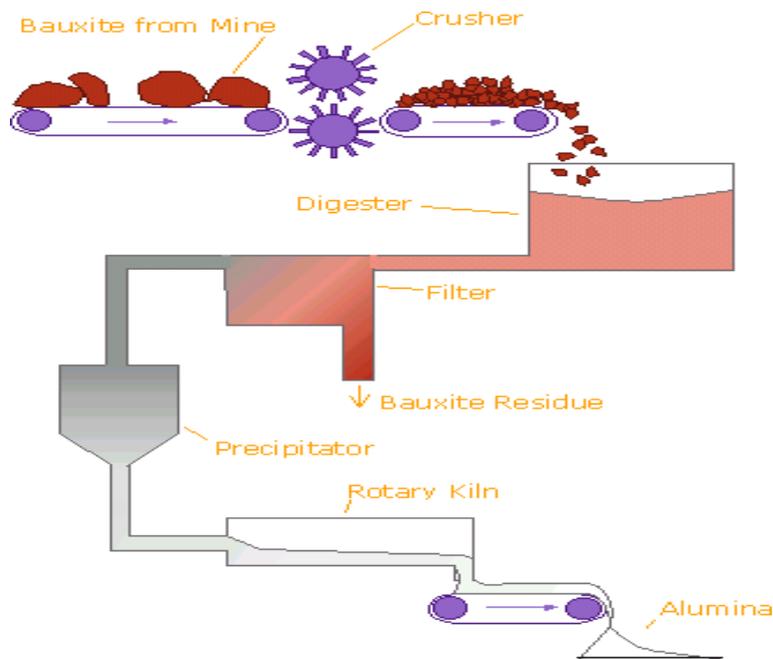
5.2 Assessment of the value chain

The value chain consists following steps:

Mining: Although aluminum is the most abundant metallic element in the Earth's crust, it is never found in free, metallic form because it is strongly reactive. Aluminum can be found in bauxite which is an aluminum ore and is the main provider of aluminum.

Refining:

¹ <http://en.wikipedia.org/wiki/Aluminium>



Smelting: Aluminum smelting is the process of extracting aluminum from its oxide alumina, generally by the Hall-Héroult process. Alumina is extracted from the ore Bauxite by means of the Bayer process at an alumina refinery. This is an electrolytic process, so an aluminum smelter uses prodigious amounts of electricity; they tend to be located very close to large power stations, often hydro-electric ones, and near ports since almost all of them use imported alumina.²

Production: alumina can be rolled, cast or extruded.

Distribution:

Recycling: Aluminum is 100% recyclable without any loss of its natural qualities. Recovery of the metal via recycling has become an important facet of the aluminum industry. Recycling involves melting the scrap, a process that requires only 5% of the energy used to produce aluminum from ore, though a significant part (up to 15% of the input material) is lost as dross (ash-like oxide).^[26] The dross can undergo a further process to extract aluminum. Recycling was a low-profile activity until the late 1960s, when the growing use of aluminum beverage cans brought it to the public awareness. In Europe aluminum experiences high rates of recycling, ranging from 42% of beverage cans, 85% of construction materials and 95% of transport vehicles.³

5.3 Common uses

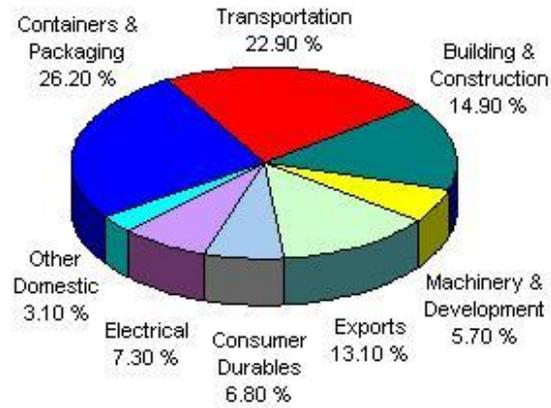
Aluminum is used in:

- Building and constructing

² http://en.wikipedia.org/wiki/Aluminium_smelting

³ http://en.wikipedia.org/wiki/Aluminium_recycling

- Transportation
- Packaging
- Electricity
- Medical and water
- Cooking



5.4 Prices

- Linked to Manufacturing and Oil Price
- 20-40% percent of the cost of Aluminum is energy costs
- Stockpiling Issue due to reduced number of major producers





6. Copper

6.1 Overview

Copper is a chemical element with the symbol Cu which is Latin and stands for cuprum. The name Copper comes from “aes cyprium” which means ore (metal) from Cyprus. The historical name shows that this is an old chemical element which has been mined and used since 10'000 years. Copper has a very high thermal and electrical conductivity only silver has a higher one. Due to this fact copper is used as a thermal conductor, an electrical conductor as well as a building material and a constituent of metal alloys. The most important alloys are brass which is an alloy from copper and zinc and bronze which is an alloy from copper and



mostly tin. Copper can also be used pure (see illustration 1). Copper is a 100% recyclable without any loss of quality whether it is in a raw state or contained in a manufacturing product. After iron and aluminum copper is the third most recycled metal. There are estimates that 80% of the copper ever mined is still in use today.⁴ In Europe the demand

structure from copper is as follows: 58% Electrical, 26% building and construction, 10% engineering and 5% transport. The largest consumer used to be the USA but with China growing over the last decades, China has overtaken USA in sense of consumption.

6.2 Value Chain

As mentioned in the introduction the value chain contains 4 steps – exploration, transport, refinery, storage and in this case recycling. First about the production: as you can see on the copper is produced all over the world with Chile, Peru and the USA as the main producers. The biggest two producing companies are Codelco (Chile) and Freeport- McMoRan (USA) which have a fraction of 20% together. The bulk of copper is transported by ships and railroad. Due to the high weight per value, transportation accounts for a lot of costs associated with copper production. In addition copper regions are among the most remote areas in the

⁴ <http://www.copperinfo.com/environment/recycling.html>

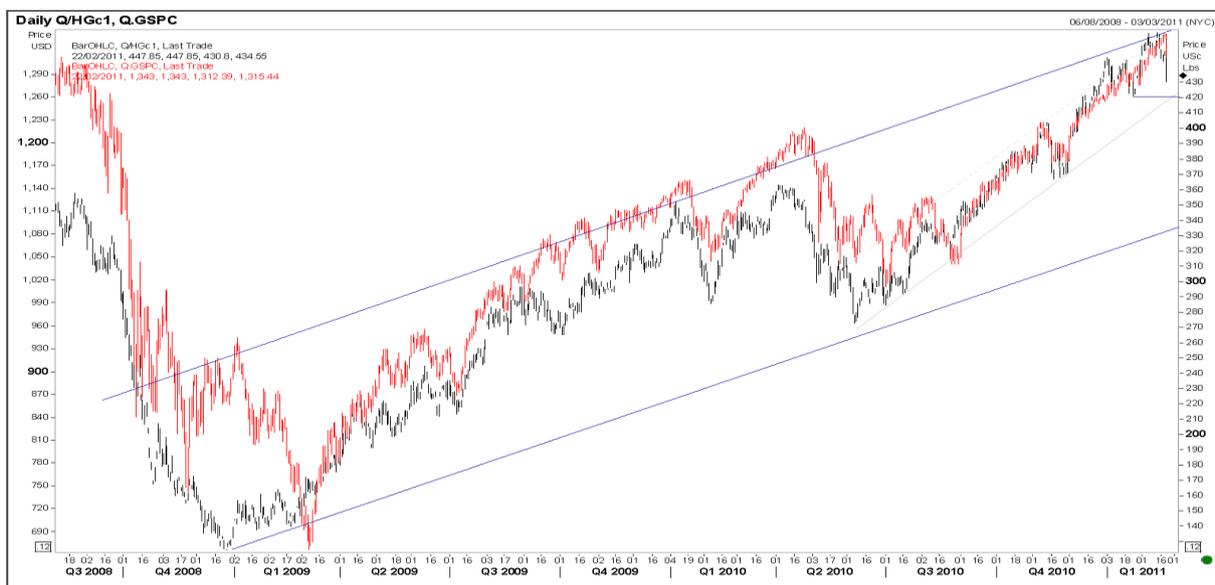
world for example the copper belt in Africa is very difficult to access. Because copper seldom exists pure in nature it has to be refined to make use of its physical properties. This can happen in two process: one is pyro process (sulfide ore and scrap) and the other is hydro process (oxid one). Despite the fact that the storage of copper is comparatively high, copper is widely stored. Attention has to be given to the environment to avoid corrosion (e.g. for electric cables). Recycling is very important for copper due to the high cost and even though recycled copper is of slightly lower quality. Nevertheless, significant shares of copper are recycled as of today

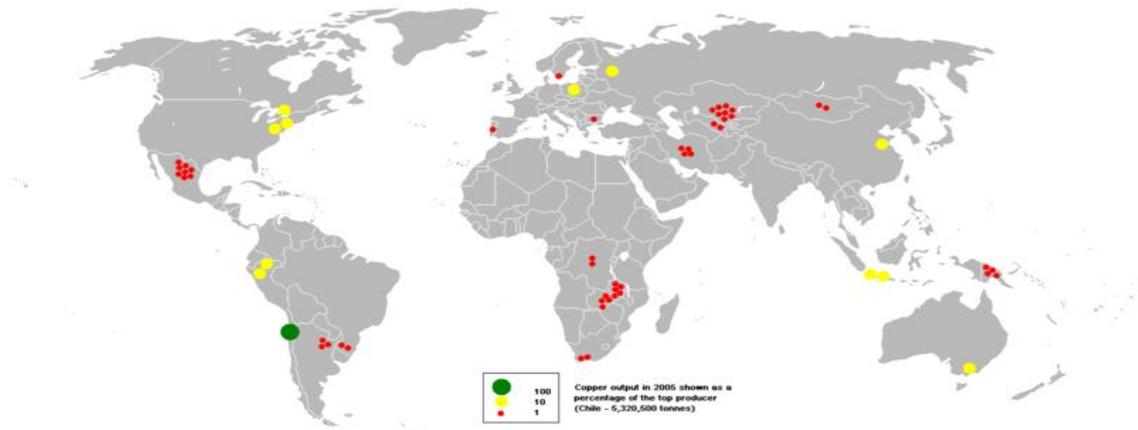
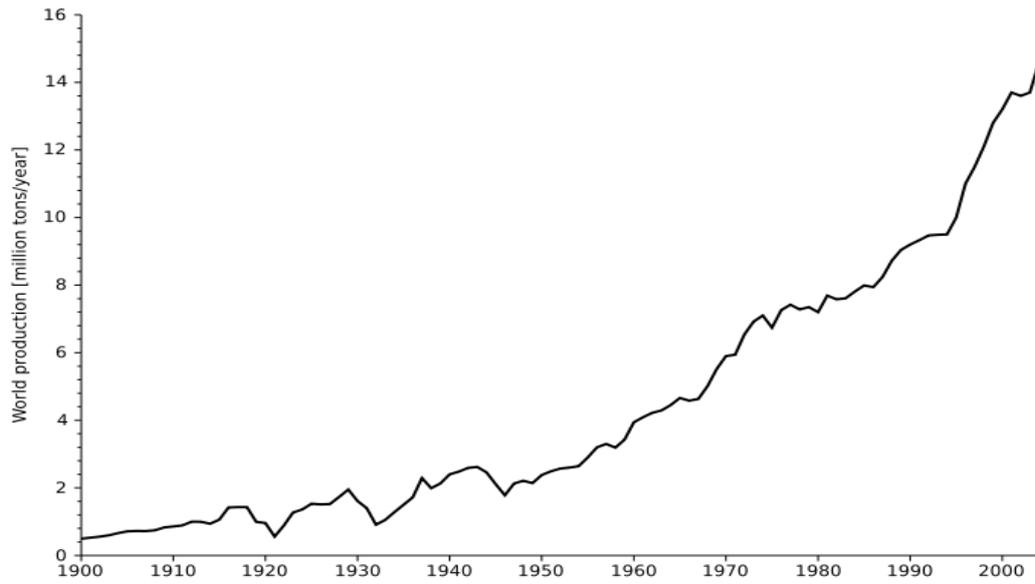
- Europe 48%
- Asia 38%
- USA 32%
- Rest of the world 16%

Copper is traded on exchanges around the world with the bulk of trading taking place in London and New York.

6.3 Important Graphs

This paragraph will show the most important graphs which will deepen the understanding of copper for example price development, copper production and so on.





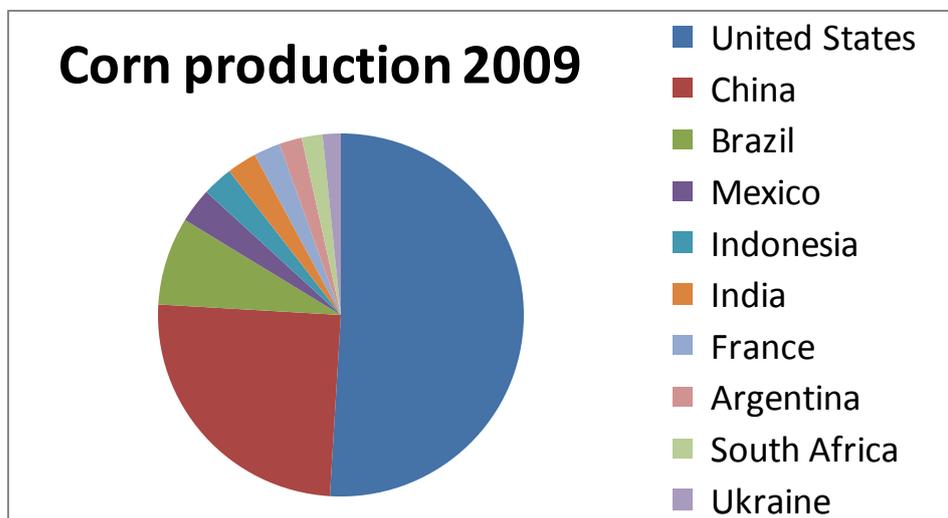
7. Corn

7.1 History

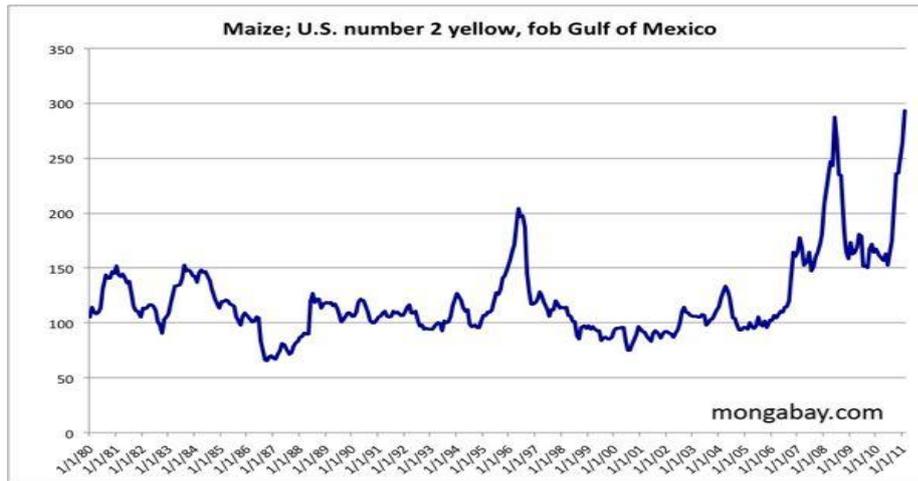
- First historical findings 10'000 BC
- It's assumed that corn is originated from Mexico
 - o Widely spread in central America in 1'500 BC
 - o Spiritual Importance
- Spread to southern US and later northern US
 - o This resulted in landscape transformation
- Corn was treated as food for people and livestock
- Today transformation to:
 - o Chemicals and medicine (starch in corn)
 - o Means of fuel production
 - o As a commodity: corn future contract

7.2 Facts & Figures

- Corn Production World Wide: 817m tones → comparison: rice: 678m t, Wheat, 682 t

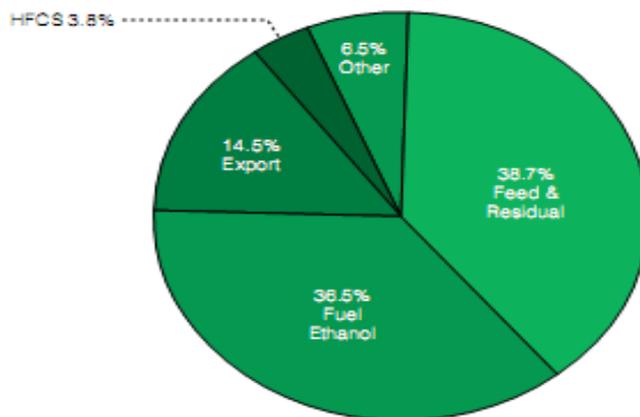


- Price development
 - o Combination of high energy prices and bad harvest resulted in high corn prices



- Demand:
 - Human Food
 - Biofuel
 - Livestock

U.S. CORN USAGE BY SEGMENT, 2010



7.3 Biofuel and Bioethanol

7.3.1 Bioethanol

- First Generation:

Ethanol produced by fermentation of sugars derived from wheat, corn, sugar beets, sugar cane and any sugar or starch that alcoholic beverages can be made from (like potato and fruit waste, etc.).
- Second Generation:

With advanced technology being developed, cellulosic biomass, such as trees and grasses, are also used as feedstocks for ethanol production.

- Third Generation:
Biofuel from algae; Algae are low-input, high-yield feedstocks to produce Biofuels.
- Bioethanol is an alcohol made by fermenting the sugar components of plant materials and it is made mostly from sugar and starch crops.
- Used as a gasoline additive to increase the octane rating, lower pollutants, and reduce petroleum use. Ethanol can be mixed with gasoline to any percentage
- Less energy dense than gasoline
- Bioethanol is widely used in the USA and in Brazil.
- In U.S mainly derived from corn (>97%)
- In Brazil mainly derived from sugar canes

Production:

In dry milling, the entire corn kernel or other starchy grain is first ground into flour, which is referred to in the industry as "meal" and processed without separating out the various component parts of the grain. The meal is slurred with water to form a "mash." Enzymes are added to the mash to convert the starch to dextrose, a simple sugar. The mash is processed in a high-temperature cooker to reduce bacteria levels ahead of fermentation. The mash is cooled and transferred to fermenters where yeast is added and the conversion of sugar to ethanol and carbon. The fermentation process generally takes about 40 to 50 hours.

After fermentation, the resulting "beer" is transferred to distillation columns where the ethanol is separated from the remaining "stillage." The ethanol is concentrated to 190 proof using conventional distillation and is then dehydrated to approximately 200 proof in a molecular sieve system.

7.3.2 Biodiesel

- Biodiesel is made from vegetable oils, animal fats or recycled greases.
- Biodiesel can be used as a fuel for vehicles in its pure form, but it is usually used as a diesel additive to reduce levels of particulates, carbon monoxide, and hydrocarbons from diesel-powered vehicles.
- Biodiesel is the most common Biofuel in Europe.

7.4 Corn Markets

- The most liquid corn future trades on the Chicago Board of Trade (CBOT). The CBOT corn future has a contract size of 5,000 bushels. It trades in cents/bushel and

has a minimum tick size of .25 cents/bushel. The CBOT corn future contract trades futures months of December, March, May, and July for each marketing year.

- The Tokyo Grain Exchange and the Dalian Commodity Exchange in China also trade fairly liquid corn future contracts.
- Minneapolis Grain Exchange (MGEX), corn derivatives: Futures and options contracts written on the National Corn Index (NCI). The NCI is an index composed of country elevator bids (90% of US elevators are represented).

8. Platinum - Palladium

8.1 Overview

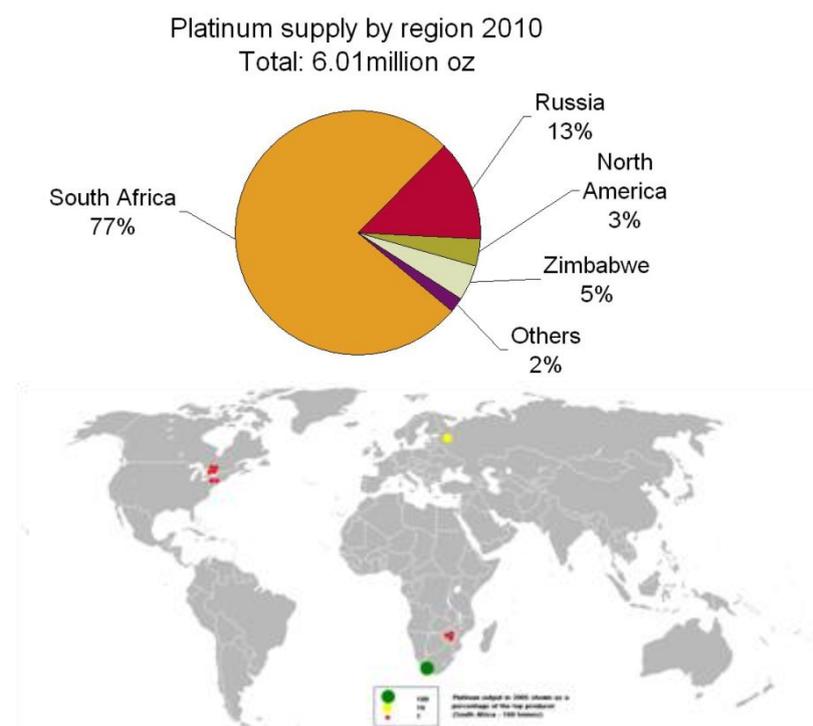
Platinum is a member of the platinum group metals (PGM) which consist the following elements:

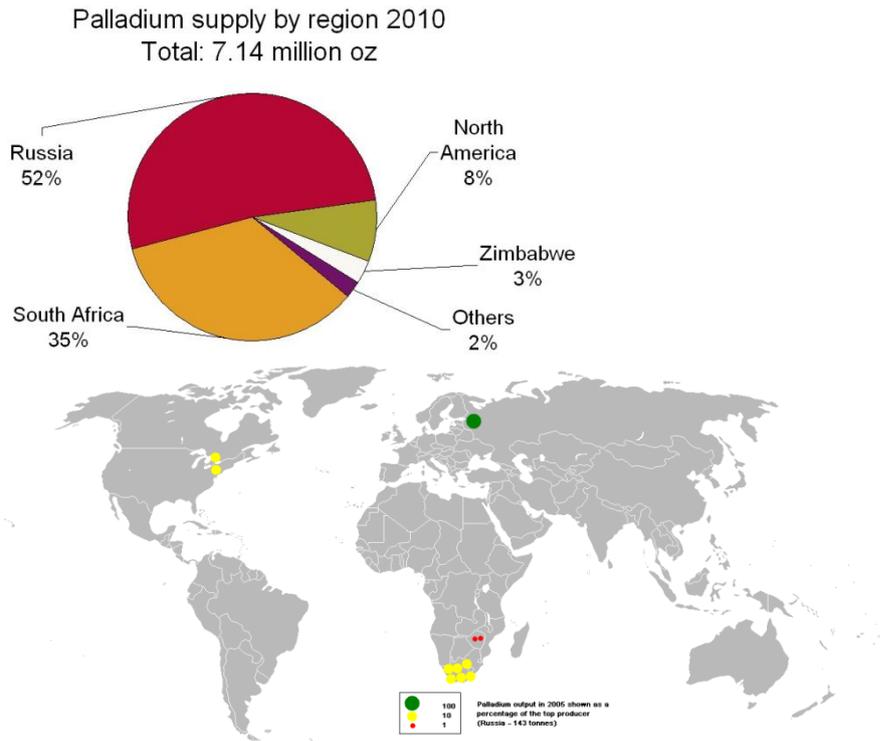
- Ruthenium (Ru)
- Rhodium (Rh)
- Palladium (Pd)
- Osmium (Os)
- Iridium (Ir)
- Platinum (Pt)

The PGM's have common characteristics such as:

- Outstanding catalytic properties
- Resistant to corrosion
- High melting point
- Rare in the earth's crust (~0.005 mg/kg)

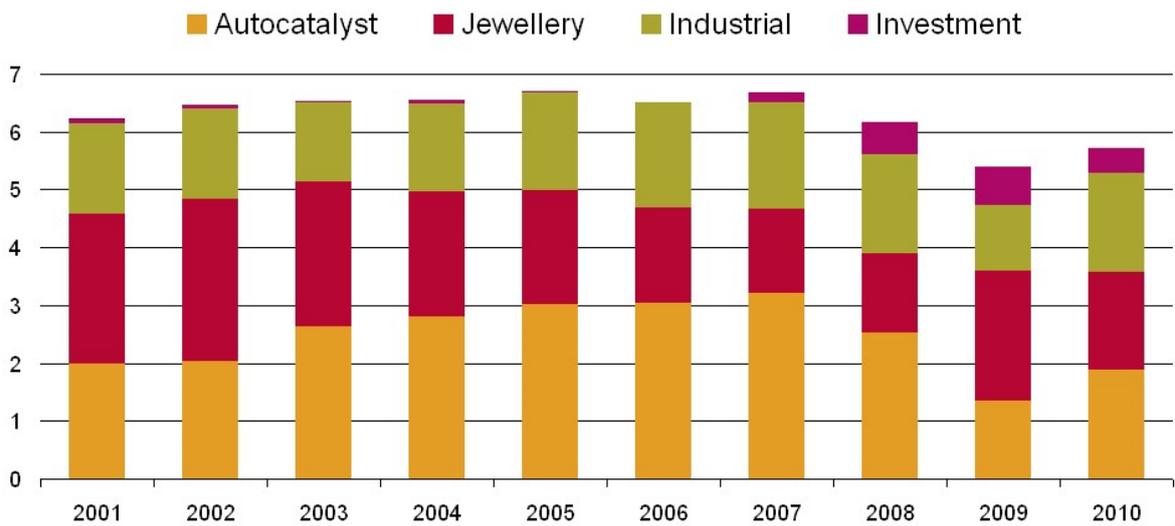
8.2 Supply



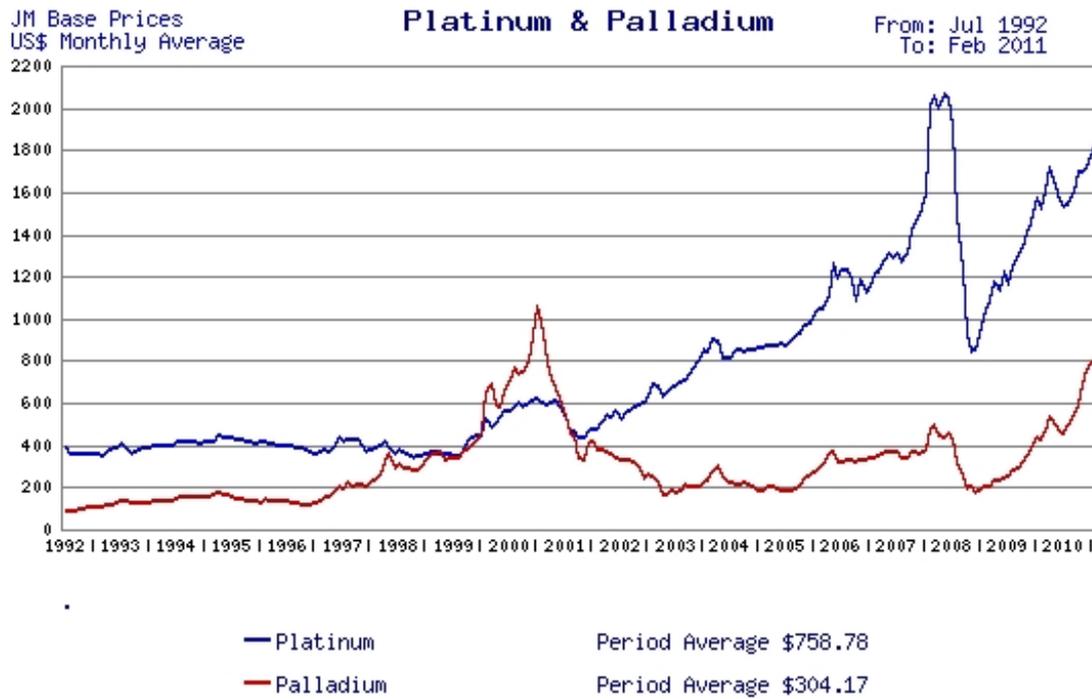


8.3 Demand

Platinum demand by application
Million oz net



8.4 Price



9. Spot Market

9.1 Overview

A spot market is a market of commodities or securities in which goods are sold for cash and delivered immediately. There exist two formal exchanges one is the European Energy Exchange (EEX) and the other is the International Exchange (ICE). As well there are also over the counter markets (OTC). The necessary infrastructures for a spot market are:

Securities → Internet

Agricultural Commodities → Traded at farms.

A spot price or also called spot rate of a commodity, a security or a currency is the price that is quoted for immediate (spot) settlement. Spot settlement is normally one or two business days from trade date. Spot rates are estimated via the bootstrapping method which is a method for constructing a (zero coupon) fixed income yield curve from the prices of a set of coupon bearing products by forward substitution. The spot price indicates expectations about future price movements in different ways. Spot prices tell us if a commodity is a:

- Non perishable commodity (e.g. silver, gold): reflects market expectations of future price movements.
- Perishable commodity (e.g. corn, tomatoes): reflects current supply and demand and not future price movements.

9.2 Forex spot markets

- Tracks spot prices of currency pairs
- Standard contract size is 100,000 units of the base currency
- Two day cash movements
- Regulated by Commodity Futures Trading Commission (CFTC) and the National Futures Association (NFA)
- Brokers earn a bid-ask spread, not commission

9.3 Energy spot markets

- Producers of surplus energy find buyers
- Natural Gas
- Price Negotiation

- Delivery (within minutes)
- Title Transfer Facility (TTF), Netherlands
- National Balancing Point (NBP), UK

9.3.1 Oil spot trading

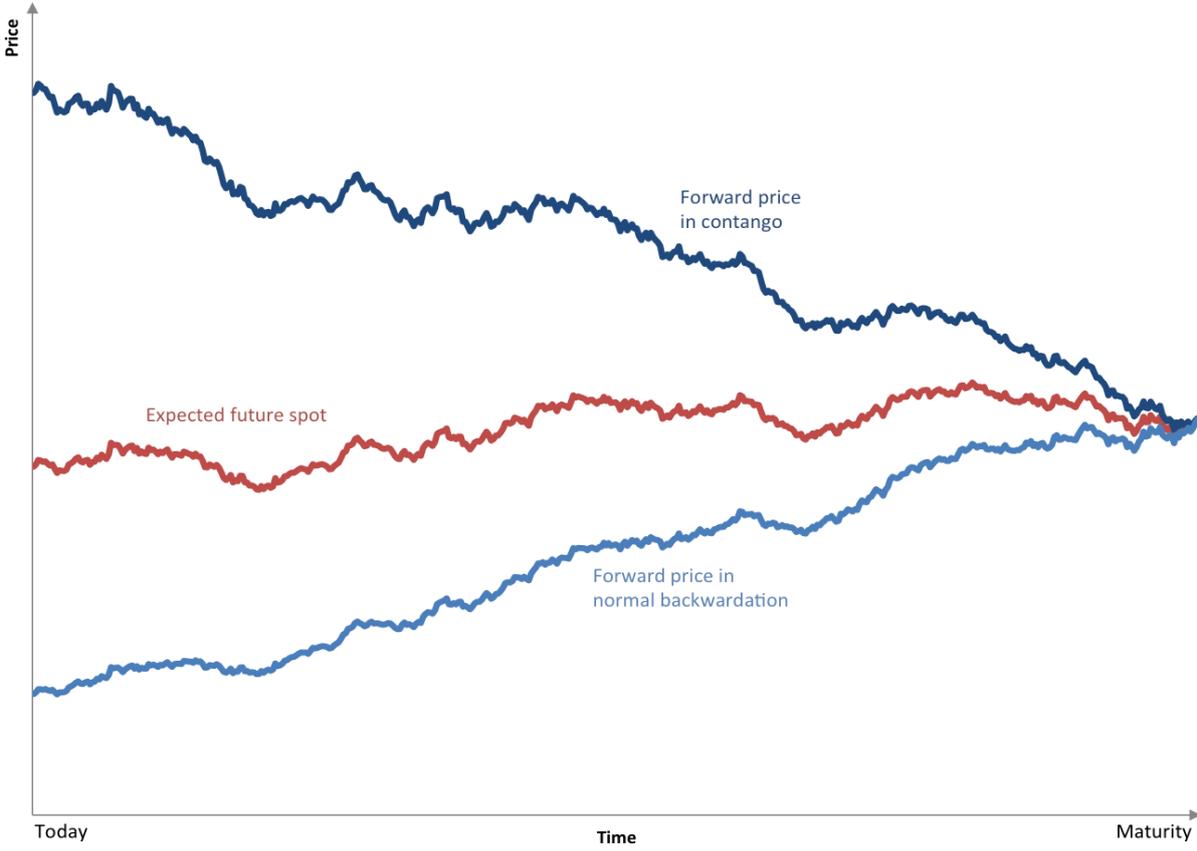
- Agreement to buy/sell one shipment of oil under an agreed price
- **Spot prices used to balance Supply & Demand**
 - ➔ Too much supply—> sell on the spot market
 - ➔ Too little supply -> purchase cargo-by-cargo, shipment by shipment basis
- **Spot markets for different qualities and regions**
 - ➔ Crude vs. Gasoline
 - ➔ Europe vs. USA



9.4 Gold spot markets

- Going rate for a direct transfer of gold for cash
- Major spot markets are in London, New York, Zurich and China
- Usually, the spot price is lower than futures prices
 - ➔ additional cost of storing the gold until delivery and the speculation effect
- Minimum transaction restrictions can be as high as half a million dollars
 - ➔ relatively few large buyers can participate directly in the gold spot markets

9.5 Contango and Backwardation

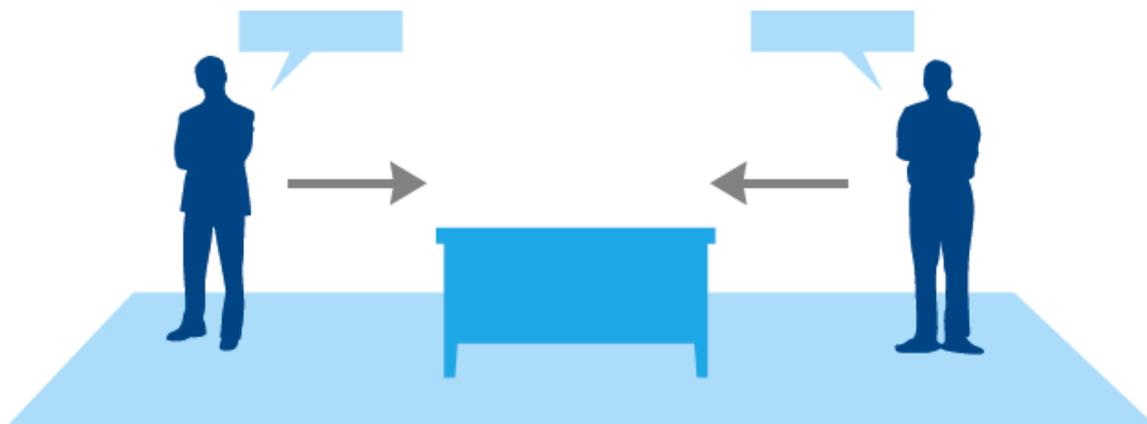


10.OTC Market

10.1 Overview

Over-the-counter (OTC) or off-exchange trading is to trade financial instruments such as stocks, bonds, commodities or derivatives directly between two parties. It is contrasted with exchange trading, which occurs via facilities constructed for the purpose of trading (i.e., *exchanges*), such as futures exchanges or stock exchanges.⁵

- Customized, bilateral agreements
- Bilateral → Characteristics: low trading volume, large trade size, institutional participants.
- Decentralized → Central counterparty clearing facilities exist e.g. CME ClearPort or ICE OTC



10.2 Issues and Solution with OTC

- Bilateral one-time agreement
 - Non-standardized contract
 - Therefore huge costs to set up a contract
- What if a party defaults?
 - Counterparty-credit risk
- How is the trade secured, what's the collateral?
- What if something unforeseen happens?

⁵ http://en.wikipedia.org/wiki/Over-the-counter_%28finance%29

Solution: Master agreements

- A OTC trade can be based on a master agreement (MA)
 - Traders agree that such a MA is the legal framework of their trade
 - The MA sets the legal terms
 - Fully and flexibly documented
- The master agreement remains unchanged
 - Only a schedule-document is adapted to the trade
- In the schedule the traders only have to agree on basic parameters such as:
 - Price
 - Maturity
 - Way of delivery

10.3 General Structure

- Main body of the Master agreement
 - Schedule(s)
 - Annex(s)
 - Confirmation
 - Definition booklets
 - And maybe a User's guide
-
- Only the schedule (and confirmation) is transaction specific

10.4 Master Agreements

There exist several master agreements. The most important is probably the ISDA master agreement which has 820 members in 57 countries and was established in 1985.

Other agreements are:

- EFET master agreement
- European master agreement
- Rahmenvertrag für Finanztermingeschäfte
- Convention-cadre relative aux opérations de marché à terme
- Swiss master agreement

10.4.1 Close-out netting (ISDA)

- Close-out netting: all obligations between two parties are consolidated
 - All outstanding contracts between the two involved parties are settled in by a single payment
 - The netting mechanism avoids «cherry picking»
- Several ways to calculate the netting payment
 - «loss»: internal models are agreed to be used
 - «market quotation»: market near settlement price (3 dealers are asked)
 - «close-out amount»: price is the cost of an equivalent contract at that time
- Netting is also used under normal circumstances for contracts due on the same date
 - Reduces transaction costs

10.4.2 Collateralization of net exposure

- A netting agreement reduces the risk exposure to a net amount
 - But what if the net exposure with one counterparty is still very large?
 - Don't trust anyone – Lehman (AA)
- The risk can be reduced furthermore by collateralization
 - Financial guarantees
 - Collateral (usually cash or government bonds)
 - Framework for collaterals given in annex (for most master agreements)
- ISDA Margin Survey 2010:
 - 60% of energy/commodity trades are subject to collateral
- Collateralization might be insufficient
 - Because prices are volatile

10.5 Conclusion

- MAs simplify trading
 - Standardization
 - Enforceability
 - Reduces probability of disputes
 - Neutral resource
- MAs increases efficiency
 - By decreasing costs (individual negotiation would be resource consuming)
 - By increasing transparency

- By reducing risks
- Counterparty risk, operational risk and legal risk
- Risk management

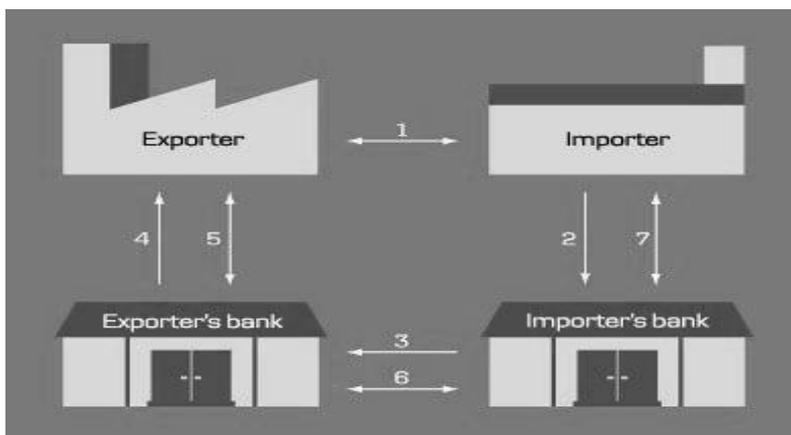
11. Letter of Credit

11.1 Definition

- A Letter of Credit (LC) is a document issued by a bank promising to pay the seller a specific amount if all conditions specified in the letter of credit are met.
- It is also called a Documentary Credits (D/C)
- L/C. A binding document that a **buyer can request** from his bank in order to guarantee that the **payment for goods** will be transferred to the seller. Basically, a letter of credit gives the seller reassurance that **he will receive the payment** for the goods. In order for the payment to occur, the seller has to present the bank with the necessary shipping documents **confirming the shipment** of goods within a given time frame.

11.2 Process Description

1. contract between importer and exporter
2. importer request LC from its bank
3. importer's bank sends LC to exporter's bank
4. exporter's bank advises exporter
5. after delivery, exporter is paid by its bank
6. importer's bank pays exporter's bank
7. importer pays his bank and receives goods



LC's in short:

- Promise to accept a transaction
- Issued by a bank
- Allows trading without actually deposit funds

- Do not replace transaction contract
- Labour-intensive

Split transaction risk

- Splits risk of transaction between seller and buyer
- Delivery and payment occur concurrently = maximum security
- Common in international payments

11.3 LCs in Trading

Example:

- Bank A gives client Lucy an LC for 1'000'000 USD
- Lucy pays yearly service charge to A
- Lucy uses LC to open a foreign exchange transaction account at trading bank B
- If trading is profitable: Profits go to account at credit Bank B
- If Lucy loses money: B asks A for funds and Lucy has depth with A (for which she pays interest).

Leverage and loss:

- Trader with LC for 1'000'000 USD may be allowed to trade 20'000'000 USD worth of currencies
- Infinite leverage, but infinite loss too
- Thus, very risky

12. Hedging Strategies for Oil Producers and Consumers

12.1 Why Hedging

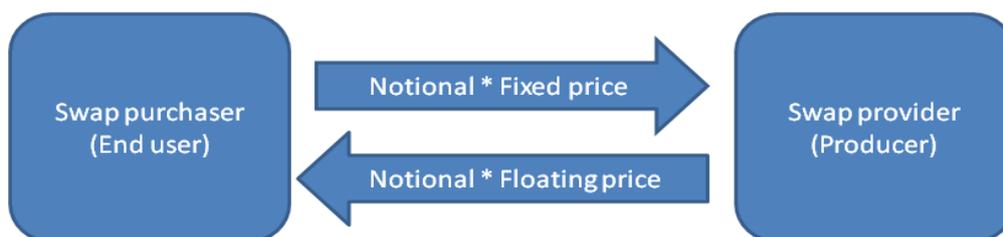


- Stakeholders prefer companies that perform as planned
- Hedging stabilizes cash flows

12.2 Hedging Strategies

Fixed for floating swaps

- privately negotiated, financially settled, covering a series of forward pricing periods
- Transfers (“swaps”) specific price risk between the purchaser and the provider through exchange of payments



- End-user : minimizes exposure to rising prices
- Producer : minimizes exposure to falling prices

Terms:

- Fixed price: size of the fixed payments (* quantity)
- Reference price/Floating price: **source or method** for the floating payment
- Swap maturity: length of the contract (which may cover several periods)

- Pricing periods: At the end of each period, the floating price is evaluated and floating and fixed payments are exchanged (monthly, quarterly, annually)
- Reference quantity: Notional amount of the commodity used to determine payments at the end of each period

Participation swaps

Conventional swaps protect:

- End users from rising prices
- Producers from falling prices

Participation swaps do the same, but allow:

- End users to benefit from falling prices at a certain participation rate or,
- Producers to benefit from rising prices at a certain participation rate

Producer	Consumer
<ul style="list-style-type: none"> • Sells forward, establishes a minimum sales price • Participation swap price is set lower than the conventional one • In exchange for that discount, the producer receives the right to participate in favorable (rising) price moves 	<ul style="list-style-type: none"> • Buys forward, establishes a maximum sales price • Participation swap price is set higher than the conventional one • In exchange for that premium, the producer receives the right to participate in favorable (falling) price moves

Terms:

- Fixed price, Reference price/Floating price, Swap maturity, Pricing periods, Reference quantity ... as usual

BUT

- Fixed payment = (Fixed Price* Reference quantity)
+ Participation Credit

Participation credit = (Floating price–Fixed price)*Reference quantity*%
IF floating price > fixed price

Spread swaps

Spread swaps allow its purchaser (End user) to achieve full price protection from significant price differentials:

For example:

- Calendar swap (difference in prices at different time periods)
- Crack swap (prices differences between different commodities)

Application: COBS (Continuous Oil Backwardation Swap)

- Since creation of Nymex, forward crude oil market has generally been in backwardation
- Negative impact on refineries which have to sell products at forward price
- Spread Value (floating):

Price of NYMEX WTI futures contract for next month – Price of NYMEX WTI futures contract for next year

Caps and Floors

Caps and floors provide the right, but not the obligation, to enter into a long or short position at a specified price.

Caps („call option”)

- establish a max (e.g. average) purchase price for future oil production
- protection from rising prices plus benefit from the potential decrease in oil prices
- end users

Floors („put option”)

- establish a min (e.g. average) sale price for future oil production
- protection from falling prices + benefit from increase in oil prices
- producers

Collars

- A collar („min-max strategy”) is a zero or low cost hedging strategy that assures the Oil Producer a min/max price range for future oil sales
- Min price = floor price
- Usually no up-front premium payment in exchange there is a „ceiling” price level. Above ceiling no benefit from price increase
- Similar to swaps, however more flexible. If prices go up, collar outperforms swap strategy.

12.3 Hybrid strategies

- Hybrids take swaps and options as the basic building blocks and combine them in some way to meet specific, individual hedging objectives
- Structured products, in OTC market, that can address any risk profile

Examples:*Extendable Swaps:*

In contrast to ordinary swaps, the maturity of the contract can be extended by the floating leg paying counterparty. Advantage: higher fixed price for the oil producer

Double-Up Swaps:

The fixed price for the oil producer is set higher than in case of a regular swap, however in exchange on any settlement date the counterparty has the right to buy a pre specified additional quantity, at the same fixed price.

Swap options (Swaptions):

Provide the right, but not the obligation to buy or sell a swap at a predetermined fixed price, in exchange for a premium payment.

Cross-Commodity Indexed Swaps:

Allow the oil producer to synthetically shift revenues from one commodity to another to reduce price risk and volatility

Barrier options („Knock-out“):

Additional expiration feature makes this option cheaper than the plain vanilla contracts.