1. Commodities: definition, classification and markets

This first chapter gives the definition and classification of commodities, and an overview of commodities markets and trading. The distinction between commodities exchanges and over-the-counter (OTC) markets is discussed as well.

1.1 DEFINITION

A commodity is a basic good used in commerce and/or in the production of manufactured goods. It is usually interchangeable with other goods or for money. Commodities are most often used as inputs in the production of other semi-finished or finished goods. Commodities are very important products in our lives today and constitute non-negligible sources of income for many nations and countries.

The quality of a given commodity may differ slightly, but it is essentially uniform across producers. In other words, there should be no difference in the same commodity produced from one producer or another one, as long as the stated quality is the same. For example, a barrel of a stated quality of oil is basically the same product, regardless of the producer. By contrast, for manufactured electronic products, the quality and features of a given product may be completely different depending on the producer.

Commonly known commodities include agricultural commodities (grains and oilseeds: wheat, corn, soybeans…), livestock (beef, pork), metals (gold, silver, copper, aluminium, platinum…), energy (oil, natural gas, electricity…), and so on.

1.2 CLASSIFICATION OF COMMODITY PRODUCTS

Commodity products are composed of agriculture commodities, metals, energy products and others like climate-related products.

1.2.1 Agriculture

Agricultural commodities are staple crops and animals produced or raised on farms or plantations. Most agricultural commodities such as grains, oilseeds,
livestock, and dairy provide a source of food for people and animals across the globe. However, some agricultural commodities are essentially used for industrial transformation. For instance, building and furniture industries use lumber from trees, and manufacturers in several sectors use latex from the rubber tree. Wool from sheep provides fabric for the clothing industry and lanolin for skin- and hair-care products.

Agricultural commodities fall in six categories:

- Cereal grains
- Oilseeds
- Meat
- Dairy
- Other soft commodities
- Miscellaneous agricultural commodities.

Cereal grains are a primary source of food, and farmers grow them to feed humans and animals and for energy production in some cases (known as biomass). The most common cereal grains are wheat, corn, oats, barley and rough rice.

Oilseeds have a high oil content, but are not easy to classify since they serve multiple purposes. Farmers grow them for the high oil content in their seeds and the meal that remains after the oil is extracted, for example, cotton, canola, palm oil and soybeans. In the case of cotton, its plant fibres have an important market in the clothing and houseware industries. Because farmers use the meal from these crops in animal feed, oilseeds often have a strong price relationship with cereal grains.

Meat commodities include live animals raised for meat, hide, organs, bones, hooves, and cuts of meat produced during the butchering of animals such as feeder cattle, live cattle, lean hogs and pork bellies.

Dairy commodities include milk, butter, whey, and cheese.

Other soft commodities refer to commodities that are farmed rather than mined. However, most commodity traders classify cereal grains, oilseeds, dairy, and meat separately. Some of the soft commodities have existing liquid global markets, for example cocoa, coffee, Frozen Concentrated Orange Juice (FCOJ) and sugar.

Miscellaneous agricultural commodities have well-developed global markets, but don’t fit easily into the above categories. This concerns for example lumber, rubber and wool.

Table 1.1 provides a list of the top agricultural commodities-producing countries and their estimated annual production.
Table 1.1  Top agricultural commodities-producing countries and their estimated annual production

<table>
<thead>
<tr>
<th>Commodity</th>
<th>Top producing country/region</th>
<th>Annual production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barley</td>
<td>European Union</td>
<td>58,765 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Cocoa</td>
<td>Ivory Coast</td>
<td>1,449 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Coffee</td>
<td>Brazil</td>
<td>2,595 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Corn</td>
<td>United States</td>
<td>377,500 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Cotton</td>
<td>India</td>
<td>30,000 (1,000 480 lb. bales)</td>
</tr>
<tr>
<td>Feeder cattle</td>
<td>United States</td>
<td>12,448 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Lean hogs</td>
<td>China</td>
<td>54,750 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Lumber</td>
<td>United States</td>
<td>357 million m³</td>
</tr>
<tr>
<td>Palm oil</td>
<td>Indonesia</td>
<td>36,000 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Rubber</td>
<td>Thailand</td>
<td>4,305 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Sugar</td>
<td>Brazil</td>
<td>39,150 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Wheat</td>
<td>China</td>
<td>126,000 (thousand metric tonnes)</td>
</tr>
<tr>
<td>Wool</td>
<td>Australia</td>
<td>478 (thousand metric tonnes)</td>
</tr>
</tbody>
</table>


1.2.2  Metals

Metals are elements, compounds, or alloys that are typically hard when present in a solid-state. They are usually characterized by their shiny appearance, electrical and thermal conductivity, malleability, ductility, and fusibility. They are usually divided into two categories: precious metals and base metals.

Precious metals are rare, naturally occurring metallic elements with high economic value. Manufacturers use these metals to make electronic components, jewellery, dental equipment and catalytic converters among other things. Traders, on the other hand, collect coins and bars made out of precious metals. Precious metals traders see these commodities as a form of money that holds its value better than printed paper money. The main precious metals with active commodities markets include gold, silver, platinum, and palladium. The remaining precious metals are rhodium, ruthenium, osmium, and iridium and they have much smaller markets compared to the previous main four.

Base metals are used in a whole range of industrial and commercial applications including construction and manufacturing. Their widespread use in everyday items makes them essential commodities in global markets. While the mining industry narrowly defines base metals as non-ferrous metals excluding precious metals, the broader definition used by U.S. Customs and Borders Protection includes commodities like aluminium, copper, iron, lead, molybdenum, nickel, steel, tin, and zinc.
The physical properties of metals make them ideal raw materials for building and manufacturing many essential items we use in our daily lives. For example, the construction sector uses metals to build bridges, homes and office buildings, railroads, and airports. The manufacturing sector uses metals to make automobiles, electronics, factory equipment, jewellery, cookware, dental equipment, protective shielding, cutlery, alongside other items. Metals also play a role in the power and storage industries. They are important components in battery production and even play a vital role in the creation of nuclear energy.

1.2.3 Energy

The energy we use can be divided into two groups: renewable and non-renewable. With the exception of ethanol and some electricity generation, most developed commodity trading markets are in non-renewable energy resources.

Non-renewable energies include:

- Petroleum products are crude oil and various refined crude oil products including gasoline, heating oil, diesel fuel, jet fuel, lubricating oils, and asphalt.
- Hydrocarbon gas liquids are gas liquids derived from natural gas and crude oil and include alkanes (e.g., propane and butane) and alkenes (e.g., ethylene and propylene).
- Natural gas consists mainly of methane that is found deep beneath the Earth’s surface.
- Coal is a sedimentary rock that can be burned for fuel.
- Nuclear energy is an energy source derived from splitting the atoms of uranium and producing a chain reaction of energy.

These non-renewable energy sources are discussed in more detail in Chapter 3.

There are five main renewable energy sources:

- Solar is the energy obtained from the sun.
- Geothermal is the energy harnessed from heat within the Earth.
- Wind is the energy harnessed from the natural movement of air.
- Biomass is the energy obtained from living matter, usually from plants. The main biomass fuel is ethanol, which is a clear, colourless alcohol produced mostly from grains or sugar.
- Hydropower is the energy obtained from flowing water.
1.2.4 Others (Weather Derivatives; Crypto-Commodities)

In addition to the above commodities, there are nowadays climate-related traded commodity products, such as weather derivatives. Also, a new generation of tradable commodities like crypto-commodities could emerge in the near future.

Weather derivatives are financial instruments that can be used by organizations or individuals as part of a risk-management strategy to reduce risk associated with adverse or unexpected weather conditions. They are index-based instruments that usually use observed weather data at a weather station to create an index on which a payout can be based. This index could be, for example, the total rainfall over a given period, which may be of relevance for a hydro-generation business, or temperature measure that might be relevant for a farmer or an insurer.

Farmers can use weather derivatives to hedge against poor harvests caused by failing rains during the growing period, or excessive rain during harvesting, or high winds in the case of plantations or temperature variabilities in the case of greenhouse crops.

Gas, power companies and insurance companies can use heating degree days (HDD) or cooling degree days (CDD) contracts available at the Chicago Mercantile Exchange (CME) to hedge or smooth earnings.

We provide more details on weather derivatives in Chapter 3.

Crypto-commodity can be defined as the general term used to describe a tradable or fungible asset that may represent a commodity, utility, or a contract in the real- or the virtual-world on the blockchain network through exclusive tokens. This can be designed similar to existing crypto-assets like cryptocurrencies that are digital currencies. Indeed, cryptocurrencies are created using digital cryptography to process transactions and create new virtual ‘coins’. Cryptocurrencies like Bitcoin are popular because they are decentralized. In other words, banks and governments don’t control access to the currency. There are thousands of Bitcoin alternatives called altcoins. Cryptocurrencies like Ethereum and Ripple have improved upon Bitcoin’s original model or created differences in their currencies to support niche uses.

Blockchain is a method of storing all Bitcoin transactions in a ledger that is attached to each and every coin. From a digital perspective, blockchain is literally a chain of programmatic blocks. Each block lists transaction details like dates, times, amounts, and traders involved. All of the blocks together are called a chain, which functions like a publicly accessible, if encrypted, database. The same technology can be used to trade crypto-commodities.
1.3 COMMODITIES MARKETS AND TRADING

A commodity market is a market where primary products (such as cocoa, wheat, corn, gold, oil, fruit, sugar, livestock…) are traded. Commodities markets can include physical trading and derivatives trading using spot markets, forwards, futures, and options on futures.

Farmers and commodity users have used commodity derivatives in commodities markets for centuries for price risk management and hedging. For financial markets investors, commodities can be used for portfolio diversification purposes beyond traditional securities holding. Because prices of commodities tend to be uncorrelated to stock and bond prices, some investors rely on commodities during periods of high market volatility. Financial instruments on commodities markets can be used to hedge against volatility in foods and commodities prices and inflation.

Commodity trading is an ancient profession with a longer history than the trading of stocks and bonds. The rise of many empires in the past can be directly linked to their ability to create complex trading systems for commodity trading. In modern times, commodities are still traded throughout the world, and in many cases, on organized modern markets, such as commodities exchanges, especially in developed economies.

1.3.1 Commodity Spot Markets

A spot market is a financial market where financial instruments and commodities are traded for instantaneous delivery. Delivery is the physical exchange of a financial instrument or commodity for a cash payment. The spot market is also known as the cash market or physical market because cash payments are processed immediately, and there is a physical exchange of assets. It contrasts with forwards and futures markets, in which delivery is due at a later date.

In a spot market, delivery and cash payment normally take place on the spot. However, in most organized markets, settlement, which is the transfer of cash for physical delivery of the instrument or commodity, normally takes two to three working days (i.e., T+2 or T+3). Despite the T+2 or T+3 settlement date, the contract between the buyer and seller is performed on the spot at the prevailing price and existing quantity.

A spot market can be an organized exchange (commodity exchange) or an OTC market. Spot markets can operate wherever the infrastructure exists to conduct the transaction.
1.3.2 Commodity Derivatives Markets

A commodity derivative is a financial instrument whose value is derived from a commodity called the underlying commodity. Derivatives are either exchange-traded or traded OTC. An increasing number of derivatives are settled via clearing houses or central counterparty (CCP) clearing, which provide clearing and settlement services on organized exchanges, as well as off-exchange in OTC markets.

Forwards and futures contracts will specify a price for delivery of a certain quantity of a commodity at a later date. Forwards contracts are available OTC; whereas futures contracts are traded on regulated commodities exchanges. Futures are usually secured by physical commodities when needed, otherwise they can be financially settled.

A futures contract provides that an agreed quantity and quality of the commodity will be delivered at some agreed future date. For example, a corn farmer can sell a futures contract on his corn, which will not be harvested for several months, and gets a guarantee of the price he will be paid when he delivers. A beverage company buys the contract and gets a guarantee that the price will not go up when it is delivered. This contract protects the farmer from price drops and the buyer from price rises. Speculators and investors also buy and sell these contracts to try to make a profit, hence providing liquidity to the market.

1.3.3 Commodities Exchanges

A commodity exchange refers both to a physical location where the trading of commodities takes place and to legal entities that have been formed in order to facilitate and enforce the rules for the trading of standardized commodity contracts and related investment products. A commodity exchange is an exchange, or market, where various commodities are traded, and where buyers and sellers meet. Trading can be carried out on an electronic trading platform or a trading floor. Electronic trading platforms have made trading more efficient, where prices are determined instantaneously, given the large number of trades in some exchanges.

Most commodities exchanges around the world trade in agricultural commodities, energy products and other raw materials (like wheat, barley, sugar, maize, cotton, cocoa, coffee, milk products, pork bellies, oil, and metals). Trading includes various types of derivatives contracts based on these commodities, such as futures and options, as well as spot trades (for immediate delivery).

When they are traded on an exchange, commodities must meet specified minimum standards, such as quality/grade specification, quantity, expiry date
and so on. In the past, commodities trading required significant amounts of
time, money, and expertise, and was primarily limited to professional traders.
Today, with the development of financial markets and technology, there are
more possibilities and options to participate in the commodities markets.

Recently, we have assisted in the merger of some of the well-known and
established commodities exchanges. The majority of existing exchanges
carry a few different commodities, although some specialize in a single group
of commodities products. The major commodities exchanges around the
word are: in the United States of America (U.S.A.): the Chicago Mercantile
Exchange Group (CME Group) and the Intercontinental Exchange (ICE); in
Europe: the London Metal Exchange (LME), the ICE Futures Europe and
Euronext; in Asia: China Dalian Commodity Exchange (DCE), Shanghai
Futures Exchange (SHFE), Tokyo Commodity Exchange (TOCOM) and the
Singapore Exchange (SGX); and in Africa: South African Futures Exchange
(SAFEX) of the Johannesburg Stock Exchange (JSE) and the Ethiopia
Commodity Exchange (ECX). As its name implies, the LME only deals with
metals.

1.3.4 Over-the-Counter (OTC) versus Organized Exchanges

An over-the-counter (OTC) market is a marketplace where buyers and sellers
meet to trade bilaterally through consensus. It contrasts with exchange trading,
which occurs via organized (and regulated) exchanges. In OTC markets, there
is no third-party supervisor of a transaction or a central exchange institution
to regulate the trade. Assets being traded may not be standardized in terms
of quantity, price, or other terms, as is the norm on commodities exchanges.
Hence, buyers and sellers negotiate all terms of trade and transact.

Exchange trading offers greater transparency and regulatory protections.
A commodities exchange has the benefit of facilitating liquidity, providing
transparency and optimal market price discovery. In an OTC trade, the price
is not necessarily publicly disclosed. OTC commodity derivatives have higher
risks but may also lead to higher profits.

Products traded on the exchange must be well standardized. This means that
exchanged deliverables match a narrow range of quantity, quality, expiration
date and identity stipulations, which are defined by the exchange and identical
to all transactions of the same product. This is necessary to guarantee market
transparency.

OTC markets do not have these above limitations. OTC trades may agree on
an unusual quantity, for example. In OTC markets, contracts are bilateral (i.e.,
the contract is only between two parties), and each party could have credit risk
concerns with respect to the other party. The OTC derivatives market is very
significant in some asset classes, for example, interest rates and bonds, foreign exchange, stocks and commodities.

**BIBLIOGRAPHY**


