

Commodity Risk



After reading this chapter you will be able to

- Describe the unique aspects of commodity-related risks
- Evaluate basic forward and futures strategies for managing commodity risk
- Identify additional strategies for managing commodity price risk

Not all financial risk arises directly from financial securities prices and rates. Commodity prices are a source of market risk and an important consideration for many organizations. Commodity price risk management is enhanced considerably by a variety of hedging products, while new frontiers in related risk management products include weather risk contracts, environmental credits, and derivatives on economic indicators.

Commodities are somewhat unusual in the risk management world. Unlike financial securities, commodities are physical assets with unique attributes. Commodities must be stored, and in many cases spoilage or deterioration is a concern. As a result, there are risk management considerations that do not apply to purely financial securities.

In some cases, commodity exposures are difficult to hedge effectively. There are several reasons why this might occur. There may be

weak correlation between the exposure and the available hedge. Alternatively, the market for a particular commodity may not be large or liquid enough to warrant actively traded derivatives, and therefore underlying exposure may be difficult to hedge given the hedging products available. In certain markets, it may be difficult to sell commodities short, since short selling requires the ability to borrow the product.

In some markets, major participants may offer fixed prices to their customers that are similar to forward contracts. Other alternative risk management mechanisms exist, such as crop insurance for agricultural products that may provide a recovery of 25 to 50 percent of losses.

Commodity risk management permits producers to hedge against declining prices. Similarly, manufacturers and other users reduce the risk of rising prices by hedging. The final consumer benefits from price stability as a result of the ability to hedge price risk.

Managing commodity price risk requires an understanding of the nature of the commodity risk to which an organization is exposed and the products available to assist in developing a risk management strategy. A strategy can then be considered in light of the organization's priorities and risk tolerance.

Historical References

The Dojima rice market in Japan began trading in the early 1700s. Dojima traded rice futures contracts in 1730, predating North American exchanges by a century. Rice was a primary commodity in Japan at that time, and therefore its price was an important economic barometer.

In the mid-1800s, grain forward contracts were recorded in Chicago, and in 1848 the Chicago Board of Trade (CBOT) was established. Commodities markets grew as innovations such as margin and standardized contracts were instituted.

Fixed-Rate Contracts

The forerunners to traded derivatives contracts were fixed-rate contracts, which have been used by producers and merchants in one form or another for centuries. Today, some large commodities participants offer fixed-rate contracts to clients for hedging purposes. These private arrangements are alternatives to forward contracts, offering convenience and enabling smaller organizations or those in illiquid markets to obtain price protection.

The major advantage of a fixed-rate arrangement is the ease with which price protection is obtained. Contracts may be customized to permit the hedger to retain rights, such as the right to sell at current market prices if it is favorable to do so. Potential disadvantages of fixed-rate contracts include their lack of liquidity and any potential contractual limitations, such as the requirement to use the existing agreement for new purchases to maintain the relationship. In many markets, buyers have the power to set favorable contractual terms, while in other markets sellers command favorable terms.

Types of Participants

Participants in the commodities markets generally fall into one of two broad classifications. Dealers make prices to others and often trade speculatively. End users and suppliers are in the commodity business, directly or indirectly, and usually hedge to protect against price and supply fluctuations. These main market participants are:

- *Commodity dealers that are active market participants on behalf of their own organizations or clients.* Dealers include financial institutions, major commodity producers, commodity trading houses, and commodity trading advisors (CTAs). Speculators exploit arbitrage opportunities or inefficiencies and in doing so provide additional liquidity.

- *Consumers of commodities, including manufacturers, refineries, and wholesalers.* Commodity consumers are exposed to rising commodity prices that increase costs of manufacture or production and reduce profit.
- *Suppliers of commodities, including farmers and growers, and mining and exploration companies.* Suppliers typically require protection against decreases in the market price of a commodity that reduce revenues. Commodity producers often cite commodity price risk as the most critical factor to their economic survival.

Since commodity prices influence production revenues, they also influence decisions about production. Below a threshold commodity price level, producers may reduce existing production or curtail new production. When commodity prices rise, production that was previously only marginally profitable may become attractive, resulting in increased production levels. As a result of the production decision, both demand and supply are affected by significant price changes. The value of inventory is also a consideration.



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Commodity Exposures

Energy prices are a key exposure for many companies. A survey of members of the Association of Corporate Treasurers published in 2003 by Ernst & Young^a found that exposure to oil and gas was the most common commodity exposure, followed by electricity prices and base metals prices.

^a “Which Path Are You On?” Treasury Operations Survey, Ernst & Young, 2003.

Commodities Markets

In addition to over-the-counter commodity derivatives markets, a number of major commodities exchanges offer futures and option products. The market continues to grow with new products such as economic statistic and weather derivatives gaining acceptance among hedgers and speculators.

Metals

The precious metals are gold, silver, platinum, and palladium. In terms of volume traded, the largest exchange for precious metals futures contracts is the COMEX division of the New York Mercantile Exchange (NYMEX).

In addition to their use in industry, precious metals—and gold in particular—are deemed to be a store of wealth and an inflation hedge. Market participants buy precious metals in anticipation of rising inflation, pushing up prices. Precious metals also have a high emotional impact since they have often been a safe-haven asset in times of financial or political upheaval. In addition, prices are subject to market influences such as interest rates and inflation.

Industrial metals include copper, tin, aluminum, nickel, zinc, and lead. Although silver is sometimes included as an industrial metal, it is usually considered to be a precious metal.

Agricultural Commodities

Agricultural commodities can be divided into several categories, including soft commodities, grains, livestock, and oilseeds. The major agricultural products, as measured by U.S. exchange trading volumes, are corn, soybeans, sugar, and soybean oil.

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Breakfast in New York

In addition to cotton, breakfast staples such as coffee, sugar, cocoa, and frozen concentrated orange juice trade at the New York Board of Trade (NYBOT), which comprises three historic exchanges:

- Coffee, Sugar, and Cocoa Exchange
- New York Cotton Exchange
- New York Futures Exchange

Grains

Grains are a key commodity group due to their ability to feed humans and livestock. Important grains include rice, wheat, canola, oats, and corn, as well as rye and barley.

There are two major categories of grains based on their use:

- Feed grains are used for feeding livestock.
- Food grains are used for human consumption. Corn is unique in that it is used both as a feed grain and a food grain.

The demand for food grain is influenced greatly by requirements for food manufacture and from other nations that require more than they produce domestically. Drought or crop failure can reduce supplies in other countries, causing higher than normal demand as grain is purchased by those needing to make up their own shortfall. The supply of food grain is affected by weather and natural disaster, as well as advances in crop yields and genetic engineering.

Wheat has the largest volume production of the food grains. Major wheat producers include Eastern Europe, the European Union, China, India, United States, Canada, Australia, and Argentina, although it is grown in almost every region of the world. One of wheat's most important uses is in the production of flour.

Livestock

The Chicago Mercantile Exchange (CME) offers trading in live animals and related animal product. The CME introduced the first futures contract on live cattle in 1964. Currently, it lists futures and options on futures on feeder cattle, live cattle, and lean hogs.

Oilseeds

Soybeans are the most actively traded oilseed commodity in terms of trading activity and volume. In addition to trading soybean contracts, market participants also trade the crush spread to lock in the processing spread, since soybeans are crushed or processed to produce soybean oil



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Trading the Weather

Weather derivatives enable organizations to hedge against adverse weather conditions that affect business and profitability. Users include utilities, insurance companies, and governments such as municipalities. The most common temperature-based weather derivatives use heating degree days (HDD) and cooling degree days (CDD), both of which measure average daily temperature against a benchmark of 65 degrees Fahrenheit.

and soybean meal. This is done by simultaneously buying soybean contracts and selling oil and meal contracts on a predetermined ratio basis.

Canola and flaxseed are also considered oilseeds. Although the price spread between the two varies considerably, there is a fundamental price relationship based on the price for the protein meal and the derivative oil, and hedgers also pay close attention to this relationship as well as to market prices.

Energy

The energy market is one of the most sophisticated commodities markets. As a result of energy price volatility, new products have continually evolved. Products trade in both the exchange-traded market and the over-the-counter market. Energy swaps, options, futures, forwards, and more complex derivatives are used by participants with increasing volumes. Price and supply are very important, and energy prices impact many other markets. Petroleum products, for example, affect the manufacturing cost of various products such as plastics and resins.

NYMEX offers contracts in a number of energy products, including the following:

- Heating oil
- Light sweet crude oil
- Brent crude oil
- Unleaded gasoline
- Natural gas
- Electricity
- Propane
- Coal



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Electricity Trading

Electricity differs from other commodities in that it cannot be readily stored. An actively traded market, electricity can exhibit significant price volatility, in particular since electricity is essential to power the technology of modern civilization. In some regions, the adjustments related to deregulation have contributed to price volatility. Electricity contracts trade in the over-the-counter market and on NYMEX, where they are cash settled.

The control of energy such as petroleum brings political and economic power, and as a result, it is subject to political maneuvers that affect prices. The early development of energy hedging products was influenced significantly by volatility arising out of turmoil in the Middle East, as greater price volatility increased demand for protection.

Other Commodities

Other commodities contracts trade both on and off exchanges. Contracts for random-length lumber and fertilizer are listed on the CME. Peanuts trade on the Beijing Commodity Exchange in China, raw silk on the Kobe Raw Silk Exchange in Japan, and rubber on the Singapore Commodity Exchange.

Commodity Forwards and Futures

A forward contract is an agreement between a buyer and a seller to exchange a commodity at a predetermined price on a future delivery date. Both the buyer and seller are obligated by the forward once it has been transacted.

A futures contract is a standardized forward contract that trades on an exchange. Performance by counterparties to a futures contract is guaranteed by a clearing corporation, while a forward contract is not.

Commodity forward and futures contracts provide similar protection from commodity price fluctuations. Forwards trade in the over-the-counter market with delivery dates and amounts customized. Related products include contracts for difference.

In the United States, the Commodity Futures Trading Commission (CFTC) is the federal agency that regulates commodity futures and options markets.

Forward Pricing

The price of a commodity for future delivery differs from the cash price by an amount known as the basis. The basis consists of carrying charges associated with owning the commodity, such as storage, interest charges on money borrowed to buy the commodity, and insurance. The basis may be positive or negative.

In a normal or contango market, the forward or futures price is higher than the cash price to accommodate the cost of carrying (owning) the commodity from the trade date to delivery. Included in this cost are financing costs, insurance, and storage costs. When demand for the commodity for immediate delivery is high, market participants push up prices for near-term delivery. A backwardation or inverted market is one that exhibits higher prices for near-term delivery than for longer-term delivery.

If the basis is not reflective of carrying charge factors, speculators could buy the cash commodity and hold it, selling an offsetting futures contract and eventually delivering against it to earn arbitrage profits. Delivery is the link between forward or futures prices and cash prices, and presuming the same delivery location and underlying product, these prices converge as contract expiry approaches, eliminating the basis entirely by delivery.

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Forward Prices

The following prices for gold futures contracts illustrate a normal market, where the farthest delivery prices are higher than near-term delivery prices:

| | |
|-----------------|----------|
| December | \$430.80 |
| February | \$432.60 |
| April | \$434.40 |
| June | \$436.30 |

Commodities prices, and forward and futures prices on commodities, are also affected by weather, political stability, perception of shortages, the availability of substitutes, and shifting consumer tastes.

Using Commodity Futures Contracts

An organization with exposure to commodity prices can use futures or forward contracts to manage its exposure. Exchange-traded transactions are conducted through a broker that acts as an intermediary between buyer and seller, while transactions are conducted directly between counterparties or through an inter-dealer broker in the over-the-counter market.

The purchase of a futures or forward contract protects against rising prices of the underlying commodity. The contract may be used for delivery or closed out and delivery taken through normal channels. When the commodity price rises, gains in the value of the futures contract should offset the higher commodity cash purchase price. If the commodity price declines, the futures contract will incur losses that should offset the lower commodity cash purchase price.

The contract reduces the risk of adverse price movements to both buyer and seller for future delivery but does not address basis risk. The basis is the difference between the cash price and the forward price and may result from differences in delivery date, location, or other factors. A shift in the basis, where the pricing relationship has changed, can adversely or favorably impact the performance of a hedge. As a result, the hedge may be imperfect, with resultant residual risk. The basis should be taken into account in assessing the likely effectiveness of a hedge before it is undertaken. In some cases, the hedge may not be effective enough to undertake.

Futures contracts trade with standardized delivery dates and specifications, the deliverable quality or grade of commodity, and contract sizes. If an outstanding contract is not offset with another prior to expiry, the seller may deliver the commodity during the allowable delivery period, as permitted by the exchange. Contracts may be based on the physical commodity or on a commodity basket or index.

Delivery

A small percentage of futures contracts involve delivery. Most futures contracts are offset prior to expiry. Many hedgers find the futures contract works adequately as a hedge, and at expiry the futures contract is offset with another (i.e., closed out or rolled forward). The sale or purchase of commodity is then transacted through normal, often local, channels.

For exchange-traded contracts, the exchange determines commodity or quality deliverable against the contract. The seller of the futures contract determines the delivery from the allowable attributes stipulated by the exchange. Exchange against physical may be possible.

Some contracts, such as NYMEX electricity and most index contracts, are cash-settled. At the contract's expiry date, the buyer and the



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Deliverable Grades

The following are deliverable grades of corn and price adjustments as stipulated by the CBOT, for the 5,000-bushel corn futures contract:

- No. 2 yellow at par
- No. 1 yellow at 1 1/2 cents per bushel over contract price
- No. 3 yellow at 1 1/2 cents per bushel under contract price

seller exchange cash based on the value of their net positions. The result is that the contract holder with a profit is compensated by the contract holder with a loss.

Mark-to-Market and Margin

The purchase or sale of a futures contract requires margin to be posted. Margin is a performance bond consisting of cash deposited with the futures broker. Minimum initial and maintenance margin requirements are set by the exchange and depend on the contract and the type of trade. Brokers may require additional margin from their customers for futures trades. The margin account is adjusted daily as contracts are marked to market to reflect changes in the value of the futures position.

Calculating a Local Basis

The difference between a local cash market price for a commodity and the current or near futures contract price is known as a local basis. This basis may be negative or positive. Hedging a physical commodity with a standardized futures contract may lead to an imperfect hedge if local


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Price Limits

Trading in futures contracts is governed by exchange regulations. Where they exist, daily price limits permit a maximum price fluctuation during a trading session. Limits may be waived during the month of delivery, since the activity of this near-date contract is likely to closely mimic the cash market. A contract is said to be limit up or limit down if it has reached its upper price limit or lower price limit, respectively.

Price limits temporarily insulate the market from panic related to major news, giving market participants time to assess new information. In addition, they help exchanges determine margin requirements, since a one-day maximum loss on open positions can be calculated. If futures contracts are being used for hedging, during times of significant price moves it is possible that prices might not completely reflect the cash or forward market due to these limits.

The following daily price limits, above or below the previous settlement, apply to agricultural products traded on the Winnipeg Commodity Exchange:

| | |
|----------------------------|--------------------------|
| Canola | \$30.00 per metric tonne |
| Flaxseed | \$20.00 per metric tonne |
| Western barley | \$7.50 per metric tonne |
| Domestic feed wheat | \$7.50 per metric tonne |

commodity prices do not move exactly with the futures prices. There may be a local basis to prices due to seasonal or quality variations or different delivery points.

Compilation of a historical average basis by tracking the difference between local cash prices and the nearby (current) futures price may be

useful in determining the effectiveness of the hedge. This tracking can be done by observation or data collection over several months or years or, alternatively, by obtaining the information from external sources, if available. Local price basis data are calculated and published for some commodities and regions by news and information services.

EXAMPLE

Change in the Basis

A lumber producer wants to ensure a selling price for the delivery of its product in three months' time. With cash prices at \$342 per thousand feet, and futures prices at \$348 per thousand feet, the mill sells a lumber futures contract at \$348 per thousand feet. The difference between cash and futures prices of \$6 is the basis.

When the mill is ready to ship lumber, it buys back an offsetting futures contract, and delivers its lumber to its regular customers. However, cash prices have fallen to \$332 per thousand feet, while the futures price is \$339.

The fall in cash prices has caused a loss on the sale of the lumber of \$10 per thousand feet. However, the futures contract has fallen only \$9 per thousand feet of lumber. The basis has widened from \$6 to \$7 per thousand feet, which impacts the mill negatively. Although the hedge was mostly effective in protecting against falling, the change in the basis represents a difference of \$1 per thousand feet.

The loss could have been a gain had the basis narrowed rather than widening, or it could have resulted in a larger loss. Although the basis shifted, the producer has benefited from protection at the futures price of \$348.

Spreads

Spreads permit hedgers and speculators to trade the differences between contracts and are commonly used in the commodities markets. There are three basic types of spreads:

- 1.** *Intra-market spreads*, which involve the purchase and sale of contracts for two different delivery dates
- 2.** *Inter-market spreads*, which involve the purchase and sale of contracts on different exchanges with the same delivery dates
- 3.** *Inter-commodity spreads*, which involve the purchase and sale of contracts for different commodities for the same delivery dates

Inter-commodity spreads can involve commodities and their derivative products. For example, the crack spread is a strategy that permits the difference between the price of crude oil and its refined products to be hedged, permitting hedgers to manage the refining spread.

Other inter-commodity spreads include:

- Frac spread, involving natural gas and propane
- Crush spread, involving soybeans and the derivative products soybean oil and soybean meal
- Spark spread, involving natural gas and electricity

Closing Out a Commodity Futures Contract

Most futures contracts are closed out prior to delivery, while many forward contracts are used for delivery. A futures or forward contract can be closed out in one of several ways:

- Take or make delivery per the terms of contract, or within exchange for physical provisions.

Commodity Risk

- Close out contract by buying/selling an offsetting contract at prevailing market rates.
- Extend or roll the contract to a future date.

A purchased contract can be offset with the sale of a contract with the same delivery and specifications as the original. Similarly, a sold contract would be offset with a purchased contract prior to expiry. A hedger may use a futures contract as price protection in a related product but have no interest in the commodity itself.

A hedger will earn a net gain or loss on the futures or forward contract, which should offset losses or gains on the actual commodity exposure. The effectiveness of the hedge depends on several factors, including the relationship between futures prices and the underlying exposure (the basis) and the number of contracts used to hedge (the hedge ratio). A significant difference between the exposure and the futures contract may result in being underhedged or overhedged.



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Commodity Swaps

Commodity swaps enable hedgers to swap production or consumption prices against the return on an index or another market. They are popular over-the-counter products, with the largest volumes in energy and metals swaps. Market makers are typically commodity dealers and financial institutions.

A commodity swap may be relatively simple or complex. Virtually any type of swap can be modified as a commodity swap. For example, an oil producer can swap its oil production price for the return on another index, such as a fixed income yield.

The seller of a futures contract can also deliver the commodity against the contract. However, most contracts are closed out with offsetting contracts rather than physical delivery taken. Physical distances may make delivery impractical and costly. Exchange for physical provisions may permit buyers and sellers to negotiate price and delivery.

Commodity Options

A commodity option provides the option buyer with the right, but not the obligation, to buy or sell a specified (notional) amount of a commodity at the strike or exercise price. In exchange for this right, the option buyer pays option premium to the option seller. The writer (seller) of the option has the obligation to deliver, or accept delivery of, the underlying if the option buyer exercises it.

Commodity options trade between institutions in the over-the-counter market and in the exchange-traded market. Exchange-traded or listed options are transacted through a broker or futures commodity merchant and have standardized expiry dates, contract amounts, and strike prices.

Commodity options may have as their underlying either a physical commodity or a futures contract. The underlying futures contract may be based on a commodity index or the physical commodity. A commodity futures contract simplifies the delivery process as compared with physical delivery.

A put option gives the option buyer the right to sell the underlying commodity or futures contract at the strike price. Similarly, a call option gives the option buyer the right to buy the underlying commodity or futures contract at the strike price.

An American-style option is exercisable by the option holder any time until expiry. A European-style option is exercisable by the option holder on the expiry date, and therefore costs less than an American-


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Options on Futures Contracts

The following are sample call option prices for options on natural gas futures contracts as traded at the NYMEX. The underlying futures contract is 10,000 MMBtu (million British thermal units) for Louisiana (United States) delivery:

| Strike Price | December | January | February |
|---------------------|-----------------|----------------|-----------------|
| 560.00 | 2.355 | 2.941 | 3.023 |
| 565.00 | 2.305 | 2.893 | 2.977 |
| 570.00 | 2.255 | 2.845 | 2.933 |
| 575.00 | 2.206 | 2.797 | 2.887 |

style option, all else being equal. From the option seller's standpoint, a European-style option involves less uncertainty than an American-style option, since the European-style cannot be exercised prior to expiry.

Over-the-counter options are traded by financial institutions, trading houses, and major commodity market participants, among others. These options are customized to the hedger's requirements with respect to expiry date, notional amount, underlying interest, and strike price.

Pricing Options

The relationship between an underlying commodity's market price and the option's strike price is a key determinant of the option's price. The favorable difference between the strike price and the market price, if any, is the option's intrinsic value. Intrinsic value is positive or zero.

A commodity option price is based on the following variables:

- Current commodity or underlying price
- Exercise privileges (e.g., American-style or European-style)
- Risk-free domestic interest rate
- Volatility of the price of the underlying commodity or futures contract
- Exercise or strike price
- Time until option expiration

An option that is at-the-money allows its holder to transact at current market (spot or forward) prices. An in-the-money option can be exercised by the option holder at better than current market prices. An out-of-the-money strike price is one that is less attractive than current market prices.

| Relationship between Strike Price and Market Price | Call Option | Put Option |
|---|------------------|------------------|
| Strike price = Market price | At-the-money | At-the-money |
| Strike price less than market price | In-the-money | Out-of-the-money |
| Strike price greater than market price | Out-of-the-money | In-the-money |

The relationship between the strike price and the market price is important because it is one determinant of an option's premium. This relationship also determines how the option's value is likely to change given a change in the underlying commodity price (the option's delta). The change in an option's value depends in part on the relationship of the strike price to market prices. The more that an option's strike price is out-of-the-money, the less likely it will be exercisable prior to expiry, and therefore the less its value will respond to changes in the price of the underlying.

When an option is purchased for hedging purposes, it is possible that the underlying commodity price will move adversely but not enough

to make the option worthwhile exercising (i.e., the option remains out-of-the-money). In that case, the option will expire worthless, resulting in a loss from the underlying commodity price change and a loss on the option premium paid.

When an option is sold as an alternative to a hedge, the option premium received acts as a buffer against market movements. However, the sold option does nothing to protect the option seller from adverse market movements. Option sellers need to manage the risks associated with sold options actively.

Buying Options

An organization that has exposure to rising commodity prices can purchase a call option to provide it with protection above a predetermined strike price. For commodity producers or those with exposure to falling commodity price, the purchase of a put option provides protection below a predetermined strike price.

With the purchase of an option, the option buyer knows that the commodity price will not be worse than the option's strike price. The option premium paid is the price of the protection offered by the option.

Selling Options

The sale of options differs from the purchase of options. The seller receives option premium and accepts an obligation to buy or sell the commodity under the terms of the option, should the option be exercised. The decision to exercise the option is that of the option buyer.

Option premium provides a buffer against further adverse commodity price changes but does not hedge the commodity price risk. The premium received depends on the factors that affect an option's price, including volatility and time to expiry.

The option seller must actively manage the exposure and may have to take alternative measures if commodity prices move adversely. The

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Selling Options

The decision to sell an option should not be based on whether levels of volatility and time value are attractive but on whether the risk-reward profiles of the strategy are reasonable and make sense. The option seller should monitor the position very closely, since a sold option alone does not constitute a hedge. A hedger that relies on a sold option to complete a hedge may find that the market moves adversely and the sold option is never exercised. The result is that no protection from adverse price movements is provided. Similarly, a speculative sold option may result in large or theoretically unlimited losses if not managed actively.

risks associated with selling an unhedged call option are theoretically unlimited. The risks associated with selling an unhedged put option are also high, although prices presumably can fall only to zero.

The sale of a commodity option involves a maximum gain of the premium received from the sale of the option. The option premium reduces the effective price for a commodity buyer and increases the effective price for a commodity seller. However, large or potentially unlimited losses can result, since the sale of an option alone does not provide protection against adverse price changes.

Commodity Collar

The purchase of options for hedging purposes is often costly. As a result, options are often packaged together as a collar to reduce hedging costs but still provide protection against an adverse price change. In

exchange for protection against adverse prices, the hedger limits the potential for better prices using a collar.

Also known as a fence or range forward, the collar involves the purchase of an option and the sale of another option on the same underlying commodity and for the same contractual expiry date. The sold option generates option premium to pay for the purchased option, reducing or eliminating the option premium and the cost of the hedge.

An organization wanting to hedge against falling commodity prices can structure a collar by buying a put option and simultaneously selling a call option. If the commodity price falls, the hedger will exercise the put and sell the underlying commodity at the strike price, while the sold call will not be exercised. If the commodity price rises above the call strike price, the buyer of the call will exercise it and pay the hedger the call strike price for the commodity, while the put is unexercised. As a result, the hedger is protected against a worst-case price (the put strike price, in this example), and the cost of the hedge is funded by limiting the hedger's ability to take advantage of favorable prices above the call strike price.

Closing Out a Commodity Option

Whether to exercise an in-the-money option or close it out often depends on convenience and the reasons for buying the option in the first place. The holder of an option can exercise it (if it is in-the-money) or allow it to expire (if it is out-of-the-money). If an option has intrinsic or time value it can also be sold.

For sold options, the only way to close out the associated obligation is to buy back an offsetting option, which can be expensive if the market has moved against the option seller or if the option is in-the-money. If the sold option is not bought back, the obligation exists because the option holder may still exercise it any time according to the terms of the contract.

Alternatively, the seller of an option can deliver or accept delivery of the underlying commodity at the strike price, per the obligation imposed by the sale of the option, should the option be exercised by the option holder.

If the option is out-of-the-money, it is not likely to be exercised, and it is worthless at expiry. The option seller will keep the option premium, which reduces the effective cost of, or increases the effective selling price for, commodity transactions.

Summary

- Commodities are physical assets with unique attributes, unlike financial securities.
- A number of strategies exist for managing commodity price risk, including forwards and futures, swaps, and options.
- Commodity derivatives trade between institutions in the over-the-counter and the exchange-traded market.
- The basis represents a source of risk in commodity hedging. Some commodities exposures may be difficult to hedge without incurring significant basis risk.