

Chapter Five: Risk Management and Commodity Markets

All business firms face risk; agricultural businesses more than most. Temperature and precipitation are largely beyond anyone's control, yet these factors are key in determining the supply of vital commodities such as soybeans, corn, wheat, oats, and rice. Global grain and soybean supplies fluctuate continuously, and market demand for these commodities varies constantly. As a result of these many uncertainties, commodity prices can vary substantially from day to day. Specialized institutions have been created and business practices developed to deal with agribusiness risk.

There exist three interrelated, but separate, markets for soybeans, soybean meal and soybean oil. The three markets are: the cash market, the market for futures contracts, and the market for options contracts. This chapter will provide an overview of each market and its role in managing risk.

Cash (Spot) Market

The cash market is where soybeans and soy products change hands in cash transactions. The majority of domestic transactions in the soy complex and for other agricultural commodities occur in the cash market. Buyers and sellers come together in an organized market, privately face-to-face, by telephone or fax, or by e-mail and the Internet, to negotiate a price with immediate delivery or future delivery. A contract for immediate delivery of the commodity is referred to as a *spot contract*. If delivery is taken at a future date, the buyer and seller may choose to establish a *cash forward contract*. For example, a feed manufacturer knows a month in advance that his company will need 100 tons of soybean meal delivered to his feedmill on a certain day. He cannot buy the meal today because no storage is available, but he is concerned that the price will increase before he actually makes the purchase. He calls the soy processor and agrees to buy the 100 tons of meal to be delivered one month later at a price set today. A formal contract is signed between the two parties. If soybean prices rise during the month, the feed manufacturer's purchase is protected. However, if meal prices drop during the month, he still has to pay the agreed upon price.

The advantages of cash forward contracts are: the transfer price is locked in; there is protection from an adverse price move; and both buyer and seller are assured of the transaction. The disadvantages are: inability to benefit from a favorable price move; difficulty in reversing the agreement; and the other party may not perform.

A variation on the cash forward contract is the *un-priced trade* where buyer and seller agree to transfer ownership of a specific quantity of a commodity or product sometime in the future but do not set the exact price. They do agree on a formula for establishing the price on the day of shipment. Usually the formula is based on a premium or discount to the cash price or the price of a certain futures contract. For example, the formula could price the purchase of soybean meal on the day of shipment at \$5.00 over the Chicago Board of Trade soybean meal October futures contract.

Futures Contracts

The Chicago Board of Trade (CBOT), which has been in existence since 1848, helped formalize grain trading by developing standardized agreements called *futures contracts*. These legally binding agreements to buy or sell a commodity sometime in the future are standardized according to the quality, quantity, and delivery time

and delivery location for each commodity. The only variable is price, which is discovered on a futures exchange. All contracts are ultimately settled either through liquidation by offsetting purchases or sales, or by delivery of the actual physical commodity.

The main economic functions of a futures Exchange, such as the CBOT, are price risk management and price discovery. The Exchange accomplishes these functions by providing a facility and trading platforms that bring buyers and sellers together. The Exchange also establishes and enforces rules to ensure that trading takes place in an open and competitive environment. For this reason, all bids and offers must be made through the Exchange either in a designated trading pit by open auction or through the Exchange's electronic order-entry trading system. Futures trades are made through a clearing organization (clearing house), which acts as the buyer to all sellers and the seller to all buyers. Therefore, if a futures contract is purchased through the clearing organization and then subsequently sold through the same organization, the transaction is offset and the contract is extinguished.

Traders that buy and sell through the futures market are not required to put up the entire value of a contract. Rather, they are required to post a *margin* that is typically between 2 percent and 10 percent of the total value of the contract. Unlike stock margins, margins in the futures markets are not down payments, but are performance bonds that are designed to ensure that traders can meet their financial obligations. When a futures trader enters in a futures position, he or she is required to post *initial margin* of an amount specified by the exchange or clearing organization. If a change in the futures price results in a loss on an open futures position from one day to the next, funds will be withdrawn from the customer's margin account to cover the loss. If a customer must deposit additional money in the account to comply with the margin requirements, it is known as *receiving a margin call*. If a price change results in a gain on an open futures position, the amount of gain will be credited to the customer's margin account.

Here is a simplified example of margin. If a trader buys one soybean contract (5,000 bushels) at \$6.50 per bushel (\$32,500 per contract), the required margin might be approximately \$1,400 (approximately 4 percent of the contract value), or about 28 cents per bushel. So for \$1,400 the trader can purchase a contract that has a delivery value of \$32,500.

Futures market participants fall into two general categories: hedgers and speculators. Futures markets exist primarily for *hedging*, which is defined as the management of price risks inherent in the ownership and transaction of commodities. The word "hedge" means protection. In the context of futures trading, a hedge is a counter-balancing investment involving a position in the futures market that is opposite one's position in the cash market. Since the cash market price and futures market price of a commodity tend to move up and down together, any loss or gain in the cash market will be roughly offset or counter-balanced in the futures market. Hedgers can include farmers, livestock producers, food processors, feed manufacturers, exporters, or importers, all of whom are seeking protection against price fluctuations in the market.

Other market participants are *speculators* and help facilitate hedging by providing liquidity, or the ability to enter and exit the market quickly, easily, and efficiently. Speculators can be a part of the general public or a member of the exchange operating

in one of the trading pits. They are attracted by the opportunity to realize a profit if they prove to be correct in anticipating the direction and timing of price changes. Because of this a seller can, at almost any time, find a buyer at or near the most recently quoted price. Similarly, buyers can find willing sellers without having to significantly bid up the price.

The cash price the supplier quotes for a given commodity usually differs from the price quoted in the futures market. This price difference is referred to as *basis* (local cash price – futures price = basis). Because basis reflects local market conditions, it is directly influenced by several factors including: transportation costs; local supply and demand conditions, such as grain quality, availability, need, and local weather; interest/storage costs; and handling costs and profit margins. Because of the affect basis can have on the final price for a given commodity in a local market, it is a common practice within the grain industry to track basis and use basis information in making marketing decisions. There are various methods to track basis but the content should include: date, cash market price, futures market price (specify contract month), basis and market factors for that date.

The two primary advantages of a soybean buyer to utilize the futures contracts are financial leverage and liquidity. Leverage provides the ability for the buyer to control large dollar amounts of a commodity with a comparatively small amount of capital. The second advantage, liquidity, is a characteristic of a market to absorb large transactions without a substantial change in the price. Liquid markets easily match a buyer with a seller, enabling traders to quickly transact their business at a fair price.

For more information about futures contracts and hedging strategies refer to the CBOT publication, “Agricultural Futures & Options: A Hedger’s Self Study Guide” available on the CBOT website: www.cbot.com under the Education section.

Options Contracts

The *option contract* is another contract that can be used for price protection on the commodity market. By definition, a commodity option is the right, but not the obligation, to buy or sell commodities at a specific predetermined price at any time within a specified time period.

Options contracts are traded in much the same manner as their underlying futures contracts. All buying and selling occurs by competitive bids and offers made in the trading pit on the floor of the CBOT, through the exchange’s electronic order-entry system, or through the CBOT’s electronic trading platform.

Traders have many choices with options contracts and the reason for buying and selling them are as diversified as the marketplace itself. This Guide will only explain a few basic concepts.

There are two distinct types of options: call options and put options. *Call options* contain the right to buy the underlying futures contract and *put options* contain the right to sell the underlying futures contract. Call and put options are not the opposite of each other, nor are they offsetting positions.

Option buyers pay a price for the rights contained in the option. The option price is known as the *premium*. An option buyer has limited loss potential (premium paid) and unlimited gain potential. The premium is paid initially when the option is bought. Since the option buyer has rights, but not obligations, the option buyer does not have margin requirements. Option buyers can exercise their rights at any time prior to the option expiration.

Option sellers collect the premium for their obligations to fulfill the rights. An option seller has limited gain potential (premium received) and unlimited loss potential, due to the obligations of the position. Since the option seller has obligations to the marketplace, they have margin requirements to ensure contract performance.

In the case of purchasing options, hedgers typically buy them to achieve price protection. If a trader is concerned prices will rise before he or she has a chance to purchase the physical commodity, the trader would buy a call option. Call options allow the trader to establish a ceiling price for a commodity he or she is planning to purchase. On the other hand, if a trader is concerned prices will fall before he or she has a chance to sell the physical product or crop, the trader would buy a put option. Puts allow traders to establish a minimum (floor) selling price. In both cases, the trader is not locked in at the ceiling or floor price as with futures or forward contracting. If the market moves in a favorable direction after purchasing an option, the trader can abandon the option and take advantage of current prices. That is different than a futures hedge, which locks in a specific price.

Selling options is a little different. The reason people sell options can be stated in just a few words: to earn the option premium. This applies to both the writing of calls or of puts. Whether to write a call or a put depends largely on one's cash market position or price outlook.

Following is just one example of a choice for an option contract. Assume it is late spring and a farmer wants to protect against lower soybean prices at harvest in the fall. The November futures price is currently quoted at \$6.75 per bushel. For a premium of 25 cents per bushel, the farmer may be able to purchase a put option that lets him lock in a harvest time selling price of \$6.75 plus his local basis. Or, for a premium of 15 cents, he may be able to buy a put option that lets him lock in a harvest time selling price of \$6.50 plus basis. If prices subsequently decline, the higher-priced option provides the farmer with up to 25 cents more protection; but, if prices rise, the savings on the cost of the lower-priced option will add another 10 cents (the difference in the premiums) to his net selling price. In effect, it is similar to deciding whether to buy an automobile insurance policy with a small deductible or a larger deductible.

Much more information about options contracts is available from the CBOT publication, "Agricultural Futures & Options: A Hedger's Self Study Guide" available on the CBOT website: www.cbot.com under the Education section. The CBOT website also has tutorials on commodity futures and options.

Explanation of Codes and Symbols

When listing futures contracts prices and options prices, quote vendors use ticker symbols, or shortened code representing the futures or options markets, along with the traded prices in code. Every commodity for which there is a futures market and

Reading Commodity Futures Price Tables

Commodity prices are available from a variety of sources, including many daily newspapers and the CBOT website, www.cbot.com. The format and terminology may vary so this Guide will describe price-reporting in general terms using the following table as an example.

Price Unit: Cents and quarter-cents per bu, (5,000 bu.)

Expiration	Open	High	Low	Settle	Change
Sept (this year)	602'0	603'4	584'6	586'6	-13'0
Nov	613'0	615'0	596'4	598'6	-12'2
Jan (next year)	621'4	622'0	604'4	605'6	-12'6
March	628'0	629'0	612'4	614'4	-10'6
May	630'4	632'0	616'0	618'4	-9'4
July	634'0	635'4	619'0	622'6	-8'2

The heading above the table indicates that the prices shown in the table are in units of cents per bushel and the contract size is 5,000 bushels. Thus, 584'6 means \$5.84 and $\frac{3}{4}$ of a cent per bushel.

The **Open** or opening price is the price or range of prices for the day's first trades, registered during the period designated as the opening of the market or the opening call. In the table shown, this year's September Soybeans on the CBOT opened at \$6.02 per bushel. Many publications print only a single price for the market open or close regardless of whether there was a range with trades at several prices.

The word **High** refers to the highest price at which a commodity futures contract traded during the day. The high price for this year's September Soybeans was \$6.03 and $\frac{1}{2}$ cent per bushel. Low refers to the lowest price at which a commodity futures contract traded during the day. The low price for September Soybeans was \$5.84 and $\frac{3}{4}$ cents per bushel.

Some publications show a close or closing price in their tables. The closing price is the price or range of prices at which the commodity futures contract traded during the brief period designated as the market close or on the closing call (i.e., last minute of the trading day). Because the last few minutes of trading are often the busiest part of the day, with many trades occurring simultaneously, the exchange computes a **settlement** price from the range of closing prices. The settlement price, which is abbreviated as **settle** in most pricing tables, is used by the clearing house to calculate the market value of outstanding positions held by its members. It is also frequently used synonymously with closing price, although they may, in fact, differ.

The **change** refers to the change in settlement prices from the previous day's close to the current day's close. The -13'0 change for September soybeans indicates that the previous day's settlement price must have been \$5.99 and $\frac{3}{4}$ of a cent.

Some tables will indicate a **lifetime high** and **low**. This refers to the highest and lowest prices recorded for each contract maturity from the first day it traded to the present.

In addition to the Chicago Board of Trade, more information on commodity futures and trading is available from the U.S. Commodity Futures Trading Commission (CFTC), an independent agency within the U.S. government. The CFTC website www.cftc.gov lists telephone numbers and email addresses to direct inquiries.

Another resource for information on commodity futures is the National Futures Association (NFA). The NFA contact information is as follows:

Chicago Headquarters
200 W. Madison St., #1600
Chicago, IL 60606-3447
(312) 781-1300
(312) 781-1467 (fax)
Website: www.nfa.futures.org

An Explanation of the Soybean “Crush”

In the soybean industry, the term ‘crush’ represents both a physical process as well as a value calculation. The physical crush is the process of converting soybeans into soybean meal and soybean oil. The crush ‘value’ is a dollar amount determined by the price of soybeans relative to the combined price of soybean meal and soybean oil. This value is traded in the cash or futures market based on expectations of future price movement of soybeans versus the components.

When a bushel of soybeans weighing 60 pounds is crushed, the conventional result is 11 pounds of soybean oil, 44 pounds of 48% protein soybean meal, and 5 pounds of waste. If the hulls are retained, the result is 44% protein soybean meal. In October 1992, the CBOT switched the soybean meal futures contract specifications from 44% to 48% protein.

The Gross Processing Margin (GPM) is the relation between the cash market price of the soybean products (meal and oil) and the cash market price of soybeans. Since soybeans, soybean meal, and soybean oil are priced differently, conversion factors are needed to equate them when calculating the GPM.

The GPM (crush) is equal to the price of 48% protein soybean meal (dollars/ton) multiplied by .022 plus the price of soybean oil (cents/pound) multiplied by 11 minus the price of soybeans (\$/bushel).

The same calculation used for the Gross Processing Margin is also used with futures contract prices from the Chicago Board of Trade and is referred as the ‘Board Crush’.

For example, if August Soybean Meal, Soybean Oil and Soybean futures prices were at \$297.20/ton, \$.3340/pound and \$9.565/bushel, respectively, the Board Crush would be calculated as $(297.20 \times .022) + (.3340 \times 11) - 9.565 = \$.6474/\text{bushel}$.

Although the Board Crush can be traded in a 1:1:1 ratio (1 Soybean futures, 1 Soybean Meal futures, and 1 Soybean Oil futures), a more precise ratio is 10:11:9 (10 Soybean futures, 11 Soybean Meal futures, and 9 Soybean Oil futures).

For more information on soybean crush, refer to the Chicago Board of Trade website: www.cbot.com. The oil and meal yield from crushing soybeans is reported weekly by the USDA in their [Soybean Crush Report](#).

Metric Conversion Guide

Soybeans

1 CBOT soybean futures contract = 5,000 bushels

Price per bushel x 36.7437 = Metric Ton Price
(For example: \$7.00 per bushel = \$257.21 per metric ton)

Metric ton price x .0272155 = Price per Bushel
(For example: \$275.00 per metric ton = \$7.484 per bushel)

1 Bushel equals 60 pounds

Soybean Oil

1 CBOT soybean oil futures contract = 60,000 pounds

Price per pound x 2204.622 = Metric Ton Price
(For example: \$0.2500 per pound = \$551.16 per metric ton)

Metric ton price x .0004536 = Price per Pound
(For example: \$600.00 per metric ton = \$0.272160 per pound)

1 Metric ton of soybean oil is equivalent to the oil in 206 bushels of soybeans

Soybean Meal

1 CBOT soybean meal futures contract = 100 short tons

Price per Short Ton x 1.102311 = Metric Ton Price
(For example: \$200.00 per short ton = \$220.46 per mt)

Metric ton price x .907185 = Price per Short Ton
(For example: \$250.00 per mt = \$226.80 per short ton)

1 Short ton = 2,000 pounds

1 Metric ton = 2,204.622 pounds