Section I

Introduction to Futures and Options Markets

Chapter 1: Introduction

Learning objectives

- Register for Commodity Challenge and join an open game
- Understanding your challenge
- Ground rules for trading in Commodity Challenge
- Illustrate a simple hedge with futures
- Learning to read grain quotes

Key terms

Hedging: To buy or sell a futures contract on a commodity exchange as a temporary substitute for an intended later transaction in the cash market.

Lift a hedge (aka offset a hedge): Buying or selling futures contracts to remove a hedge position in the market. For example, a producer who sold November contracts to hedge the value of new crop soybeans might consider lifting the hedge if the outlook for higher prices improves.

Welcome to Commodity Challenge, an on-line trading game that features real-time quotes from grain futures markets and numerous local cash markets located throughout the country. It differs from other trading simulations by emphasizing the use of futures and options for risk management purposes (hedging), and not for speculation.

Every player in Commodity Challenge is asked to play the role of a grain producer. Each player produces the same number of bushels - for example, 25,000 bushels of wheat. The price of wheat can vary greatly - as high as $20 and as low as $4 per bushel since 2005 – and you have to make some difficult choices. You may choose to sell your wheat into the local market at the current price, or you may choose to store the grain for sale later in the year. Alternatively, you may choose to sell futures contracts to establish a price, or use option contracts to establish a minimum price. You have many choices, and Commodity Challenge gives you the chance to explore your alternatives, learn about the markets and have some fun in a safe, “no real money” situation.

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Commodity Challenge is also an opportunity to compete with your peers as you manage the risk and opportunity in marketing your crop. What price will you get for your production?

What is the "Challenge" in Commodity Challenge?

Every player in a Commodity Challenge game faces the same challenge. As a grain producer, your hard work to produce a crop is exposed to price changes in the market. Commodity Challenge asks you to think like a risk manager, while understanding that risk management is not simply risk avoidance. Grain ownership is both a risk and an opportunity, depending upon whether or not prices rise or fall. Your challenge is to maximize grain prices and revenues, while keeping your risk exposure at a level that does not put your business in peril. You have a position to manage!

How will you manage your position? In "Introduction to Grain Markets," your choice of tools is large. If, for example, you harvested 100,000 bushels of corn, you have action choices that include…

- Do nothing and hope prices trade higher
- Sell cash grain to your local market today
- Store the grain to sell later
- Store the grain and sell futures contracts with the intent of later selling cash grain and "lifting" the futures hedge
- Store the grain and buy put options to establish a minimum price
- Sell cash grain and re-own it with the purchase of call options – another way to establish a minimum price

Ground rules for trading in Commodity Challenge

Commodity Challenge differs from other trading simulations because of the link to cash markets, and by emphasizing the use of futures and options for hedging, and not for speculation. However, there is opportunity for players to trade the market. Here are some important ground rules to consider when participating in Commodity Challenge.

1. Players cannot sell more than the amount of grain produced, or the amount of grain you are expected to produce. If you harvested 100,000 bushels of corn, then you can sell no more than 100,000 bushels using any combination of the cash and futures (or options) markets. If you expect to produce 30,000 bushels of soybeans, then you can sell no more than 30,000 bushels using any combination of forward, futures and options contracts. To sell more than you produce would be a speculative attempt to "short" the market.
2. Players cannot own more than the amount of grain produced, or the amount of grain you are expected to produce. If you harvested 100,000 bushels of corn, you are not allowed to store the grain and place an order to buy more corn through the futures or options markets. If you expect

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to produce 30,000 bushels of soybeans, you are not allowed to place an order to buy more soybeans through the futures or options markets. This is a speculative action and not good risk management – your risk of loss of loss due to lower prices is increased.

3. Players are allowed to re-own cash grain sales by purchasing futures contracts, or with an equivalent options position, within the limit of their initial position. Players are also allowed to re-buy and re-sell futures and options positions, again within the limits of their initial position.

"Introduction to Grain Markets" is intended to serve as an introduction to important terms and concepts in grain markets. It is also intended as a hands-on opportunity to play the role of a risk manager, and try a number of different pricing tools. The game is there for some competitive fun, and to keep you engaged as you learn about the markets.

A Note on Futures and Options Contracts as "Derivatives"

Most news sources have adopted the practice of referring to futures and options contracts as derivative contracts. This is a relatively new term - 25 years ago, the leading University textbook on agricultural futures and options did not have the term "derivative" in its index or glossary. Technically, the term derivative is correct because a futures contract "derives" its value from the underlying cash market. Options contracts derive their value from the underlying futures market.

While "derivative" is technically correct, futures and options contracts are different from many over-the-counter financial derivatives. To be specific, futures and options contracts are highly liquid, transparent, standardized and marked-to-market daily. Many financial derivatives lack these great qualities.

Problems with collateralized debt obligations and other financial derivatives have transformed "derivative" into a negative term. In Commodity Challenge training segments, we will not use the term derivatives when referring to futures and options contracts.

A Simple Hedge Illustrated

Instead of selling grain in the local market, grain producers can also hedge using futures contracts. For example, think of yourself as a farmer and you are finishing the harvest of 50,000 bushels of corn. Cash prices are good but your corn is high in moisture, and subject to moisture discounts. Instead of selling your grain now, you decide to store it on-farm, and dry the corn using your own facilities.

The drying process and completing harvest will take time. Your tax expert suggests

To illustrate hedging with futures and options, we use T diagrams to track three market components…

1. Cash
2. Futures / Options
3. Basis

…over the time period that the hedge is in place.

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that deferring sales into the next year would be helpful on your tax returns. How can you, the producer, make certain that today's good price is still there next year? By selling futures contracts against corn held in storage. Each futures contract is 5,000 bushels, so you must sell 10 contracts to fully hedge your position. The initial hedge is illustrated below.

Hedging Example

Date	Cash	Futures	Basis
October	Harvest 50,000 bushels of corn and place into storage for drying. Cash price: $5.00/bu.	With December corn futures at $5.50/bu. and July futures at $5.80, you decide to sell 10 contracts of July corn futures to hedge against a price decline. Futures price: $5.80	Basis is -$0.50/bu., or 50 cents "under" the December contract, and 80 cents under the July contract. ($5.00 cash - $5.80 futures)

This simple hedge raises more questions than answers. For example, the December and July contracts are not the same price – there is 30 cents "carry" from December to July. Why the price difference, and why sell the July contract? And what is basis? Why is the cash price 50 cents less than the December futures price, and 80 less than the July price? Understanding the answers to these questions is key to understanding hedging, and we will cover these topics in later segments.

By spring, harvest is complete, the corn is dry and a new year has arrived. It's time to "lift" the hedge and deliver corn to the market.

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Hedging Example

Date	Cash	Futures	Basis
October	*Harvest 50,000 bushels of corn and place into storage for drying.* *Cash price: $5.00/bu.*	*Sell 10 contracts of July corn futures to hedge against a price decline.* *Futures price: $5.80*	*Basis is 80 cents under the July contract.* *($5.00 cash - $5.80 futures)*
May	Sell corn to a local elevator. Cash price: $5.25/bu.	"Lift" the hedge - buy back July corn futures. Futures price: $5.50	Basis is now 25 cents under the July. ($5.25 cash - $5.50 futures)
Results	$0.25/bu., or 25 cents/bu. gain	+$0.30/bu., or 30 cents/bu. gain	Final price for corn is $5.55/bu. ($5.25 cash + $0.30 futures gain)

The T diagram illustrates a convenient way to look at hedging with futures; cash and futures columns (and actions) are to be equal and opposite. A farmer owns 50,000 bushel of corn in October that needs price protection, so he/she sells 10 contracts (10 contracts * 5,000 bus./contract = 50,000 bus.) of corn futures. At a later time, the farmer sells cash corn and offsets the hedge by buying back the futures contracts. The premise of hedging is that cash and futures prices generally move together. When they do, the futures hedge reduces the price risk the farmer faces because gains (or losses) in the cash market are offset by losses (or gains) in the futures market.

Consider a different scenario. What if cash and futures prices had risen sharply from October to May? A gain in the cash market would have been erased by a loss in the futures markets. This is the cost of hedging – the short hedge protects against lower prices, but also takes away the chance to benefit from higher prices.

Your final price for corn from the hedge was $5.55/bu., or 55 cents better than the harvest price. The hedge did more than "avoid risk" and protect against a lower price. The hedge put more money on the bottom line, because the basis improved from 80 cents under the July contract in October to 25 cents under in May. Note that your final price was 55 cents better than the harvest price, and equal to the 55 cent gain in basis - a seasonal gain in basis is normal in many parts of the country.

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It is worth repeating that hedging and risk management is more than risk avoidance. Hedging is an opportunity to make money on seasonal basis patterns and from carrying charges (in this case, the carry from the December to July contracts).

Learning to read grain quotes

Cash and futures grain quotes are presented in a number of different ways, and the differences can be confusing. If you want to understand grain markets, you're going to have to learn to read price quotes.

Most grains and soybeans trade in bushels. Cash grain quotes are typically shown in $ per bushel, while futures and options quotes are typically shown in cents per bushel. Adding to the confusion is the fact that futures and options trade in ¼ and 1/8 cent increments, respectively.

In Commodity Challenge, cash and futures quotes can be found on the dashboard, below the leaderboard. Commodity Challenge shows futures quotes in cents per bushel, i.e. December corn futures trading at $4.98¾/bu. is shown as 498.75. Click on the link for December corn futures and you will be taken to the CME, which shows it as 498'6. The CME (and many other sites) show futures and options quotes in cents per bushel, with the last number representing eighths of a cent (e.g., '6 is 6/8's of a cents, or ¾ cent, or .75). The smallest price increment in grain futures contracts is ¼ cents per bushel. For options contracts, the smallest price increment is 1/8 cents per bushel.

Here is another futures quote example.

March soybean futures trading at $11.75 ¼ per bushel.

- Commodity Challenge shows the quote as 1175.25
- The CME website shows the quote as 1175'2

Options can be more confusing because there are two prices quoted – the strike price of the option and the premium paid for the right. Here is an example of an options quote.

580 call on July corn (the right to buy July futures at $5.80 /bu.) trading at a premium of $0.47625/bu., or 47 and 5/8 cents per bushel.

- Commodity Challenge shows the strike price as $5.80, but does not show quotes for premiums
- The CME website shows the strike price as 580, while the premium is shown as 47'5 (5/8 = 0.625)

Cash grain quotes are the most consistent of all quotes, generally shown in $/bu., and often rounded to the nearest whole cent. Wheat trading at $6.50 per bushel in a local market is shown just this way; in $/bu. and not cents/bu.

Confusing? I think you're right. But grain quotes have not established a consistent method of presentation, so you need to learn to read all variations.

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Further readings and resources

Introduction to CME Agricultural Complex (online presentation - video tutorial on risk management and how hedging works using futures and options), CME Group, 2012 http://www.cmegroup.com/education/interactive/webinars-archived/introduction-to-cme-agricultural-complex.html

Grain and Oilseed Futures and Options (brochure), CME Group, February 2012 http://www.cmegroup.com/trading/agricultural/grain-and-oilseed-futures-and-options-fact-card.html

Self-Study Guide to Hedging with Grain and Oilseed Futures and Options (handbook), CME Group, April 2012 http://www.cmegroup.com/trading/agricultural/self-study-guide-to-hedging-with-grain-and-oilseed-futures-and-options.html

Exercise #1

Register for Commodity Challenge, establish your profile and join a game. Place an order in the market!

Registering to play Commodity Challenge is easy and free. Go to commoditychallenge.com and click the "Join" button to create your account. You will be asked for your name and email address, and to create your own password (write it down!). Once submitted, you will receive a conforming email with a link to complete the registration process.

Establishing your profile is also easy to do. Under the "Toolbox" tab select "settings." Here you can establish a handle and add a short bio and picture. You will also find privacy options and the ability to change your password and email.

To join a game, simply click the "Find A Game" button from your home page. Your game may be password protected, and you will need to get a password from your game leader. Commodity Challenge will also make available a number of open games (not password protected). I encourage every player to join an open game. Open games are a great way to learn about the Commodity Challenge game and how to place orders.

Place an order in the market! Make a sale in the cash or forward market, or make a sale using futures or options.

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