

Section II

Basic Pricing Tools

Chapter 10: Selling futures to hedge the value of grain

Learning objectives

- Understand how producers can sell futures to hedge the value of grain

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.

Short hedge: The sales of futures contracts against cash ownership, including inventory, expected production and/or forward purchases. The short hedge protects the hedger against falling prices.

Put on a hedge (aka place a hedge): Buying or selling futures contracts to establish a hedge position in the market. A cattle feeder concerned about lower cattle prices might call a broker and put on a hedge by selling June live cattle futures.

Lift a hedge: Buying or selling futures contracts to remove a hedge position in the market. 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 (in this example, price risk is present again once the hedge is lifted – new crop cash bushels are again at risk).

Unwind a hedge: Making a purchase or sale in the cash market and, at the same time, lift a corresponding hedge position in the market. A hedger who sold May futures against corn held in storage might unwind the hedge in the spring, i.e. sell the corn out of storage and buy back the open futures position.

The feed buyers version of Commodity Challenge puts you in the position of a dairy or livestock producer. As such, the game emphasizes the buyer's perspective in controlling feed costs. We spent the last chapter on long hedging, or the purchase of futures to lock-in feed costs. The long hedge protects the hedger against rising prices.

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However, not every participant in the grain market is concerned with higher prices. Grain producers, for example, worry about lower grain prices. This is the other side of risk management – players who need a short hedge. A short hedge involves the sales of futures contracts against grain inventory or a crop developing in the field. The short hedge protects the hedger against falling prices.

There is a simple formula you can use to calculate the expected price from a short hedge...

$$\text{_____} + \text{_____} - \text{_____} = \text{_____}$$

futures price (when sold) + expected basis – fees = expected price

While this formula looks similar to the formula used to calculate the purchase price from a long hedge, please note a subtle difference; in a short hedge, fees are subtracted from the price received (with the long hedge, they add to the cost).

Let’s look at an example of a producer selling corn futures contracts to hedge the value of corn before harvest. Ignore brokerage fees.

Hedging the value of grain before harvest

Date	Cash	Futures	Basis
March	Planting starts soon and with December futures above \$4.50/bu., a producer can lock in a profitable price for 50,000 bu. corn at harvest.	Put on a hedge. Sell 10 contracts of December corn futures to lock in a profitable selling price at harvest. Futures price: \$4.65	Expected harvest basis is -\$0.40 Z, or 40 cents under the December contract. Expected harvest price is \$4.25/bu.

In this example, the producer sold December futures at \$4.65/bu. and expected a basis of 40 cents under (-\$0.40) at harvest. Let’s do the math and ignore brokerage fees.

$$\$4.65 + (-\$0.40) = \$4.25$$

futures price + expected basis = expected price

Let’s “unwind” this short hedge at harvest (sell harvested corn and buy back futures) under three different scenarios - higher, lower and steady futures prices. Ignore brokerage costs.

Scenario #1: The price of corn at harvest is \$3.88/bu. and December futures are trading at \$4.24/bu.

Date	Cash	Futures	Basis
May	With December futures above \$4.50/bu., a producer has a chance to lock in a profitable price for 50,000 bu. corn at harvest.	Sell 10 contracts of December corn futures to lock in a profitable selling price at harvest. Futures price: \$4.65	Expected harvest basis is -\$0.40 Z, or 40 cents under the December contract. Expected harvest price is \$4.25/bu.
Harvest	\$3.88/bu.	Buy back 10 contracts of December corn futures at \$4.24/bu.	Harvest basis is 36 cents under the December contract.
Results	Corn sold for \$3.88/bu.	Futures gain of 41 cents/bu. (\$4.65 - \$4.24)	

You have two ways to calculate your final price for corn at harvest. The first way is to take your cash price at harvest and add or subtract your gain or loss in the futures market.

$$\$3.88 \text{ cash price} + \$0.41 \text{ futures gain} = \$4.29$$

True hedgers calculate the final price using the original formula.

$$\$4.65 \text{ futures sales} + (-\$0.36 \text{ basis at harvest}) = \$4.29$$

Scenario #2: The price of corn at harvest is \$4.94/bu. and December futures are trading at \$5.20/bu.

Date	Cash	Futures	Basis
May	With December futures above \$4.50/bu., a producer has a chance to lock in a profitable price for 50,000 bu. corn at harvest.	Sell 10 contracts of December corn futures to lock in a profitable selling price at harvest. Futures price: \$4.65	Expected harvest basis is -\$0.40 Z, or 40 cents under the December contract. Expected harvest price is \$4.25/bu.
Harvest	\$4.94/bu.	Buy back 10 contracts of December corn futures at \$5.20/bu.	Harvest basis is 26 cents under the December contract.
Results	Corn sold for \$4.94/bu.	Futures loss of 55 cents/bu. (\$4.65 - \$5.20)	

Again, you have two ways to calculate your final price for corn at harvest. The first way is to take your cash price at harvest and add or subtract your gain or loss in the futures market.

$$\$4.94 \text{ cash price} - \$0.55 \text{ futures loss} = \$4.39$$

True hedgers calculate the final price using the original formula.

$$\$4.65 \text{ futures sales} + (-\$0.26 \text{ basis at harvest}) = \$4.39$$

Scenario #3: The basis at harvest is -\$0.37Z (37 cents under the December contract).

Date	Cash	Futures	Basis
May	With December futures above \$4.50/bu., a producer has a chance to lock in a profitable price for 50,000 bu. corn at harvest.	Sell 10 contracts of December corn futures to lock in a profitable selling price at harvest. Futures price: \$4.65	Expected harvest basis is -\$0.40 Z, or 40 cents under the December contract. Expected harvest price is \$4.25/bu.
Harvest			Harvest basis is 37 cents under the December contract.
Results	Corn sold for \$???	Futures gain or loss of ???	

True hedgers calculate the final price using the original formula, and show that all you need to know is basis!

$$\$4.65 \text{ futures sales} + (-\$0.37 \text{ basis at harvest}) = \$4.28$$

Further reading

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>

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>

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Exercise #10

In April, you decide to sell 5 contracts of November soybean futures to lock in a price for 25,000 bushels of soybeans to be delivered at harvest.

I want you to complete the transaction at harvest, under three different scenarios; higher futures prices, lower futures prices and steady futures prices. Fill in the blanks in the T-diagram, showing the price you received in \$/bushel or in gross sales revenues (price * quantity). Ignore brokerage costs.

Scenario #1: *higher futures prices*

Date	Cash	Futures	Basis
April	Planting starts soon and with November futures above \$11/bu., you have a chance to lock in a profitable price for soybeans at harvest.	Sell 5 contracts of November soybean futures to lock in a profitable selling price at harvest. Futures price: \$11.10	Expected harvest basis is -\$0.65X, or 65 cents under the November contract. Expected harvest price is \$10.45/bu.
October (harvest)	Sell 25,000 bushels of soybeans to the local elevator for \$11.35/bu.	Lift the hedge - buy back November soybean future at \$12.10/bu.	What is the harvest basis? _____
Results	What did you receive in the cash market? \$/bu. _____ \$total _____	What was your gain or loss in the futures market? \$/bu. _____ \$total _____	What final price did you receive for your soybeans? \$/bu. _____ \$total _____

Scenario #2: lower futures prices

Date	Cash	Futures	Basis
April	You have a chance to lock in a profitable price for soybeans at harvest.	Sell 5 contracts of November soybean futures to lock in a profitable selling price at harvest. Futures price: \$11.10	Expected harvest basis is -\$0.65X, or 65 cents under the November contract. Expected harvest price is \$10.45/bu.
October (harvest)	Sell 25,000 bushels of soybeans to the local elevator for \$8.75/bu.	Lift the hedge - buy back November soybean future at \$9.30/bu.	What is the harvest basis? _____
Results	What did you receive in the cash market? \$/bu. _____ \$total _____	What was your gain or loss in the futures market? \$/bu. _____ \$total _____	What final price did you receive for your soybeans? \$/bu. _____ \$total _____

Scenario #3: steady futures prices

Date	Cash	Futures	Basis
April	You have a chance to lock in a profitable price for soybeans at harvest.	Sell 5 contracts of November soybean futures to lock in a profitable selling price at harvest. Futures price: \$11.10	Expected harvest basis is -\$0.65X, or 65 cents under the November contract. Expected harvest price is \$10.45/bu.
October (harvest)	Sell 25,000 bushels of soybeans to the local elevator	Lift the hedge - buy back November soybean future	The basis at harvest is 58 cents under the November contract.
Results			What final price did you receive for your soybeans? \$/bu. _____ \$total _____

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