

Section II

Basic Pricing Tools

Chapter 9: Commodity buyers and long hedging (buying futures)

Learning objectives

- Buying futures contracts to hedge against rising prices

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.

Long hedge: The purchase of futures contracts against cash market sales or to protect against higher input costs. The long hedge protects the hedger against rising 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 higher feed costs might put on a hedge by buying March corn futures.

Offset a position: Buying or selling futures contracts to remove a position in the market. A producer who bought 10 July corn contracts to hedge feed costs would offset the hedge by selling 10 July corn contracts.

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 purchased March futures to protect against rising feed costs might unwind the hedge, i.e. buy corn in the local market and sell the open futures position.

Hedging with futures is a tool used by producers, merchants, processors, and raw material buyers to reduce risk and guide storage decisions. Hedging grain purchases and sales is standard operating procedure for grain elevators, processors and exporters. Producers and end users (food and feed manufacturers) practice hedging in a more selective manner.

In simple terms, there are only two basic hedges used in the futures market; the short hedge and the long hedge. A long hedge involves the purchase of futures contracts or to protect against rising input

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costs. The long hedge protects the hedger against rising prices. Long hedging is the topic for this segment. In particular, we will look at dairy or livestock producers buying futures to hedge feed costs.

A short hedge involves the sales of futures against cash ownership. Cash ownership includes inventory, expected production and/or forward purchases. The short hedge protects the hedger against falling prices. We will discuss short hedging in the next chapter.

In addition to dairy and livestock producers seeking to manage input costs, other common long hedgers include flour millers, grain exporters and food manufacturers. Flour millers often sell flour to bakeries for forward delivery and buy wheat futures contracts to protect against rising wheat prices. Nearly all grain export sales are made with forward cash contracts for delivery as far as a year ahead. A soybean exporter can commit to a selling price on soybeans that may not be shipped for months because they buy soybean futures contracts to protect against higher prices. Finally, food manufacturers use wheat, sugar, cocoa futures (etc.) to lock in their input costs.

We want to explore buying futures to hedge feed costs. In order to understand hedging and the motivation of the hedger, let’s start with a simple statement of what hedging is not – hedging is not simply a ploy to avoid risk. Risk avoidance, in fact, is overemphasized as the sole motive for hedging. Let’s look at an illustration of a pure risk avoidance hedge.

Pure Risk Avoidance Hedging Example by a Corn Buyer

Date	Cash	Futures	Basis
November	Harvest has filled your bins, but you would like to price another 20,000 bushels of corn needed to supply your dairy until the next crop. Cash price: \$4.43/bu.	Put on a hedge. Buy 4 contracts of May corn futures to hedge against a price increase. Futures price: \$4.90	The basis is -\$0.47, or 47 cents under the May contract. (\$4.43 cash - \$4.90 futures)

This is a straightforward example of a long hedge to cover feed costs. Transactions of this sort occur every day. Let’s jump ahead a few months and watch the corn buyer “unwind” the hedge by buying corn and selling May futures.

Date	Cash	Futures	Basis
November	The bins are full but you need another 20,000 bushels of corn. Cash price: \$4.43/bu.	Put on a hedge. Buy 4 contracts of May corn futures. Futures price: \$4.90	The basis is -\$0.47, or 47 cents under the May contract. (\$4.43 cash - \$4.90 futures)
April	Buy 20,000 bushels of corn. Cash price: \$4.76/bu.	Unwind the hedge. Sell May corn futures. Futures price: \$5.23	Basis remains at 47 cents under the May contract. (\$4.76 cash - \$5.23 futures)
Results	Corn costs are up! 33 cents/bu. higher than harvest	+\$0.33/bu., or 33 cents/bu. gain	

How convenient! Corn costs are 33 cent higher since harvest, but the “loss” is offset by a 33 cent gain in the futures market. This sort of “perfect hedge” can only occur if basis does not change (and basis, in this example, was unchanged at 47 cents under the May contract). However, *basis does change*, and smart hedgers try to profit from a changing basis.

We know from our study of basis that the basis in grain markets exhibits a seasonal pattern. We also know that basis is generally more predictable than prices. By using futures contracts to hedge, the hedger is moving away from an unknown risk (will corn prices trend \$1/bu. higher or lower in the next month?) to a risk they better understand (will the basis get stronger in the next month?). Hedgers are trying to manage (not avoid) risk, and profit from anticipating changes in the basis.

Now that we understand that hedging is more than avoiding risk, let’s explore a dairy or livestock producer buying futures contracts to hedge feed costs. Note how the basis affects the final price received.

There is a simple formula to calculate the expected price paid for a commodity when using a long hedge with futures.

$$\underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{1cm}} = \underline{\hspace{2cm}}$$

futures price (when bought) + expected basis + fees = expected price

Let’s look at an example of a cattle feeder buying corn futures contracts to hedge against rising feed costs. Ignore brokerage fees.

Cattle feeder buying corn futures to hedge against rising feed costs.

Date	Cash	Futures	Basis
March	No action taken at this time. Cattle feeder anticipates buying actual corn for feeding during the summer.	Concerned about the prospect of higher corn prices during the summer, a cattle feeder buys 8 contracts (40,000 bu.) of CBOT September corn futures. Futures price: \$4.06	The cattle feeder expects a local buying basis of -\$0.10, or 10 cents under the September contract, during the summer months. futures price + expected basis = expected price \$4.06 + (-\$0.10) = \$3.96

This is a straightforward long hedge by a cattle feeder. Transactions of this sort occur every day. Let's jump ahead to summer and watch the cattle feeder complete the hedge by buying corn and selling futures contracts (again, ignore brokerage fees).

Date	Cash	Futures	Basis
<i>March</i>	<i>No action taken.</i>	<i>Cattle feeder buys 8 contracts of CBOT September corn futures at \$4.06/bu.</i>	<i>The cattle feeder expects a local buying basis of 10 cents under the September contract.</i>
July	Buy 40,000 bushels of corn. Cash price: \$4.21/bu.	Unwind the hedge by selling September corn futures. Futures price: \$4.29	Actual basis is 8 cents under the September contract (-\$0.08). This is 2 cents stronger than expected.
Results	Purchase corn for feeding for \$4.21/bu.	+\$0.23/bu., or 23 cents/bu. gain on the hedge	Final price paid is \$3.98/bu. (\$4.21 cash price - \$0.23 futures gain)

In March, the cattle feeder expected to lock-in an expected price of \$3.96/bu. for corn. In July, when corn was purchased and the futures position offset, the final price was \$3.98/bu. Why was the final price 2 cents higher than the expected price?

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The answer is found in the corn basis. The expected price of \$3.96/bu. was based on an expected basis of 10 cents under the September contract. The actual basis turned out to be 8 cents under the September contract. The basis was 2 cents stronger than expected and that means the final price was also 2 cents more than expected, or \$3.98/bu.

Basis is generally more predictable than prices. By purchasing futures contracts to hedge his feed costs, the cattle feeder was able to lock-in corn costs and limit risk to changes in basis.

Two additional points about the long hedge. First, the cattle feeder probably would not complete the hedge with one transaction, as shown in this example. Unwinding a hedge can be more of a process over time, involving smaller corn purchases with partial offsets of the futures position occurring. Second, while the long hedge protects against higher prices, it also takes away the opportunity to benefit from lower prices. In this example, had futures prices fallen below \$4.06/bu., the lower cost of cash corn in July would have been partially offset by a loss in the futures market.

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>

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>

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Exercise #12

You have a hog finishing operation. In November, you decide to buy 4 contracts of May corn futures to lock-in your input costs on 20,000 bushels of corn to be purchased in March, April and May.

I want you to complete the transaction, 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
November	Corn harvest is over and you are concerned about the possibility of corn costs rising next spring.	Buy 4 contracts of May corn futures to lock in a purchase price on corn to be fed in March, April and May. Futures price: \$4.01	Expected corn basis a local buying basis of -\$0.30/bu., or 30 cents under the May contract. futures price + expected basis = expected price $\$4.01 + (-\$0.30) = \$3.71$
March	Buy 20,000 bushels of corn from local sources for \$4.53/bu.	Offset the hedge - sell May corn futures at \$4.89/bu.	What is the corn basis in March? \$/bu. _____
Results	What did you pay for corn in the cash market? \$/bu. _____ \$total _____	What was your gain or loss in the futures market? \$/bu. _____ \$total _____	What final price did you pay for corn? \$/bu. _____ \$total _____

Scenario #2: lower futures prices

Date	Cash	Futures	Basis
April	Corn harvest is over and you are concerned about the possibility of corn costs rising next spring.	Buy 4 contracts of May corn futures to lock in a purchase price. Futures price: \$4.01	Expected corn basis a local buying basis of 30 cents under the May contract. expected price = $\$4.01 + (-\$0.30) = \$3.71$
March	Buy 20,000 bushels of corn from local sources for \$3.20/bu.	Offset the hedge - sell May corn futures at \$3.45/bu.	What is the corn basis in March? \$/bu. _____
Results	What did you pay for corn in the cash market? \$/bu. _____ \$total _____	What was your gain or loss in the futures market? \$/bu. _____ \$total _____	What final price did you pay for corn? \$/bu. _____ \$total _____

Scenario #3: steady futures prices

Date	Cash	Futures	Basis
April	Corn harvest is over and you are concerned about the possibility of corn costs rising next spring.	Buy 4 contracts of May corn futures to lock in a purchase price. Futures price: \$4.01	Expected corn basis a local buying basis of 30 cents under the May contract. expected price = $\$4.01 + (-\$0.30) = \$3.71$
March	Buy 20,000 bushels of corn from local sources for \$3.74/bu.	Offset the hedge - sell May corn futures at \$4.01/bu.	What is the corn basis in March? \$/bu. _____
Results	What did you pay for corn in the cash market? \$/bu. _____ \$total _____	What was your gain or loss in the futures market? \$/bu. _____ \$total _____	What final price did you pay for corn? \$/bu. _____ \$total _____