Section I

Introduction to Futures and Options Markets

# Chapter 8: Basis

## Learning objectives

- The relationship between cash and futures prices
- Basis patterns
- Basis in different regions
- Speculators trade price, hedgers trade basis

## Key terms

**Basis:** The price difference between the cash price at a specific location and the price of a specific futures contract.

**Convergence:** The process by which the difference between the price of a futures contract and the price of the underlying cash commodity becomes smaller or narrows. Due to convergence, basis for grains should be close to 0 (equal cash and futures prices) in the delivery month, at the delivery point.

**Long vs. Short the Basis:** If I own the cash commodity, I am long the basis. If I sell the cash commodity, I am short the basis.

Basis is the price difference between the cash price at a specific location (e.g., the price of corn at a grain elevator in Iowa) and the price of a particular futures market (e.g., May corn futures at the CBOT).

Basis links the specific (a local cash price) to the worldwide (futures prices). Many factors influence futures prices because grains are traded in a world market. Like futures, cash prices can be affected by world events, but local issues are also very important. Concerns that have little impact on futures prices but a big impact on local prices include…

1. Transportation costs and availability: An elevator that transports bushels by train or truck may not have railcars or trucks available. This is not an issue for the world market for soybeans, but it may influence your local soybean price (the basis portion) for a period of time.

2. Local supply and demand: An ethanol plant opens in your town. From a worldview, this is just one more of hundreds of plants that have opened in the past decade. The impact on futures prices will be small. However, this will have a big impact on the demand for corn in your area, and the impact on local corn prices (basis) will be significant.

Availability of local storage: Wheat harvest is in full swing, and a bumper crop in your part of the state has filled local elevators. Is this a big concern in the world of wheat? Probably not, but your local price – and basis - will be affected.

Cash and futures prices are very difficult to predict. Basis, however, shows a seasonal pattern and is more predictable. Basis is more predictable because cash and futures prices must come together in the delivery month. This process, known as convergence, occurs because a futures contract is a real contract for delivery.

Basis math is simple:

**cash price - futures price = basis**

$6.60 - $6.95 = -$0.35 (or 35 "under")

alternatively...

**cash price = futures price + basis**

$6.60 = $6.95 + -$0.35

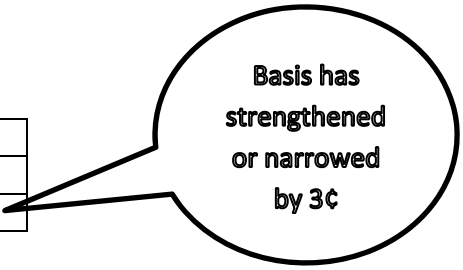
In the grain industry, the practice of using basis quotes rather than the prices in their day-to-day trading activities goes back over 100 years.

The grain trade – merchandisers, processors and exporters – is dominated by hedgers. Hedgers, by definition, offset cash positions with a futures position. Hedgers are not very concerned with price levels ($5 vs. $8 corn) because they don't trade price. Hedgers trade basis, and they typically quote cash prices as a basis of so many cents "under" or "over" the futures price.

Basis has its own language. Traders often talk of a "strong" or "narrow" basis. Any time the difference between cash and futures price gets less negative or more positive, the basis is said to have "strengthened" or "narrowed." When the difference between cash and futures price gets less negative or more positive, the basis has "weakened" or "widened."

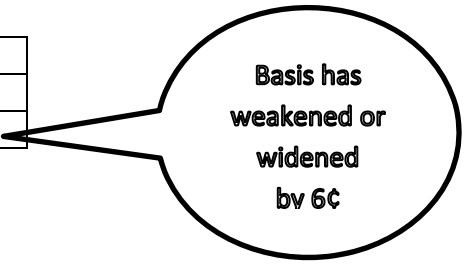
Examples:

| Week | Cash Price | December Corn Futures Price | Basis |
|---|---|---|---|
| #1 | $6.60 | $6.95 | -35¢ |
| #2 | $6.52 | $6.92 | -32¢ |




Example:

| Week | Cash Price | December Corn Futures Price | Basis |
|---|---|---|---|
| #1 | $6.60 | $6.95 | -35¢ |
| #2 | $6.69 | $7.10 | -41¢ |



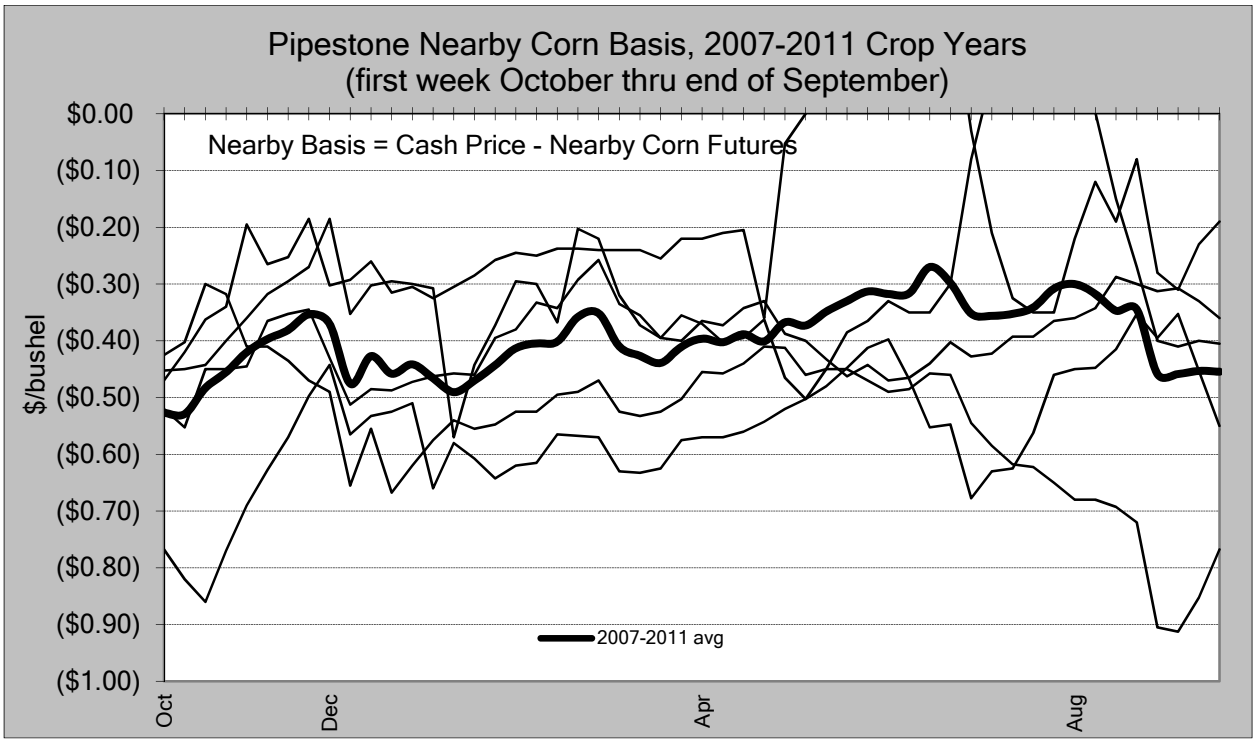

In the delivery month, at the delivery point (e.g. specific locations on the Illinois Waterway for corn or soybeans), basis should be close to zero due to convergence. Cash and futures prices converge because of the privilege to make or take delivery of futures contracts. In the delivery month, at a local point (e.g. central Iowa), basis will reflect freight costs to Chicago, as well as local storage, demand and supply issues.

Good hedgers know their basis. They have an opinion about basis; whether it will strengthen or weaken in the weeks and months ahead. Successful hedgers - producers, processors and merchandisers - must understand the factors that drive their local basis. Let's examine seasonal changes in basis for corn, soybeans, and wheat at several Minnesota points.

(Keep in mind that these charts show the nearby basis, which is the cash price less the nearby futures price. The nearby futures contract changes. From example, from December 1 to February 28, the nearby corn contract is the March contract. From March 1 to April 30, it’s the May contract.)

Pipestone, MN nearby corn basis: Over the past five years, corn prices varied sharply. Cash prices traded as low as $3 per bushel in October of 2007, and as high as $8 per bushel in 2012. A chart of corn prices would show no readily discernible patterns. On the other hand, a chart of the nearby corn basis shows a distinct seasonal pattern.

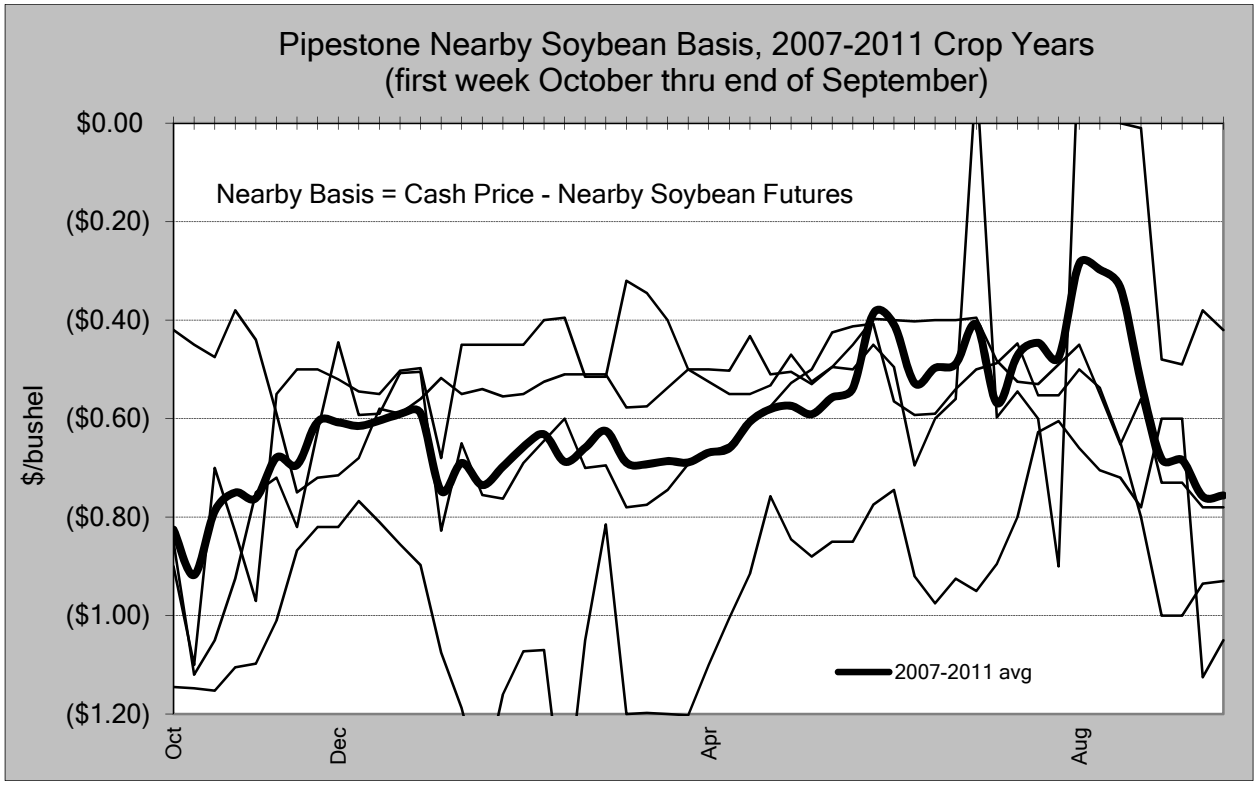
Basis levels are weakest in October (harvest) at 40-55 cents under the December contract. (Note the record low basis of 80 cents under in October. This occurred in 2010). After harvest, basis stabilizes at an average of 40 cents under. By late spring, basis reaches its strongest point, averaging close to 30 cents under. By midsummer, the adjustment to harvest basis levels begins. Basis is not perfectly predictable. Year-to-year variations are apparent, but much less than futures price variations. A seasonal pattern is evident.



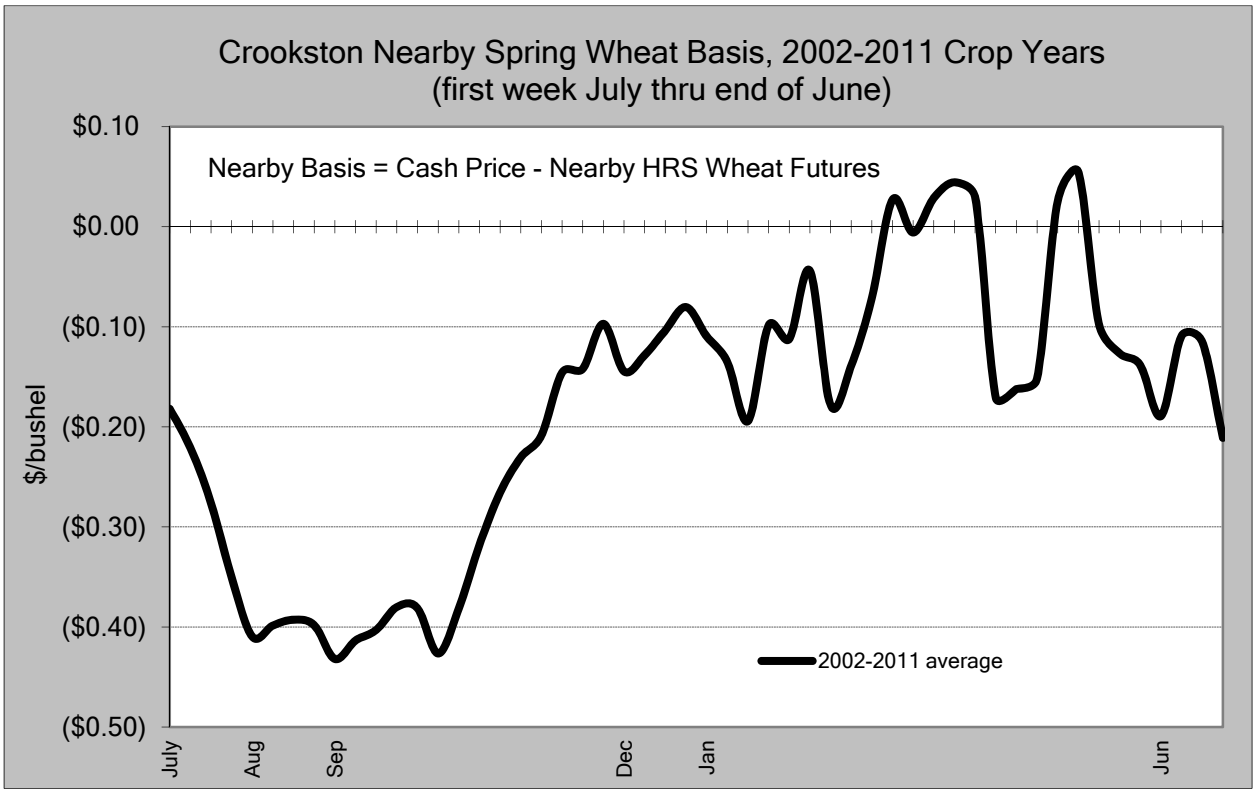
Pipestone, MN nearby soybean basis: Over the past five years, soybean prices varied even more than corn, from a low of almost $7 per bushel in 2008, to a high of nearly $18 per bushel in 2012. Despite this high level of price volatility, the nearby soybean basis shows a distinct seasonal pattern.

Soybean basis levels are weakest in October (harvest) at 80-100 cents under the November contract. After harvest, basis stabilizes in a range of 50-70 cents under. By late spring and summer, basis reaches its strongest point. By midsummer, the adjustment to harvest basis levels begins.

Like corn, soybean basis is not perfectly predictable. Year-to-year variations are even more apparent in soybeans, but still much less than futures price variations. A seasonal pattern is evident.



Crookston, MN nearby wheat basis: The basis in wheat is generally less predictable than corn. Wheat is a food grain and wheat quality variations affect the basis. The chart shows a 10-year average of basis, and a seasonal pattern is clear. During August (harvest in the Northern Plains) basis levels are widest, averaging about 40 cents under the nearby September contract. The average basis peaks at option price (zero basis) or cash price over futures by the following spring. Summer is a period of sharp adjustment, back to harvest basis lows.




Clearly, basis for grains show a distinct seasonal pattern. At harvest, when supplies are plentiful and the demand for storage is high, cash prices often trade at a large discount to futures prices. The basis is normally weakest (or widest) at harvest. After harvest, once the crop is stored away, basis often strengthens (or narrows). The basis often peaks in late spring.

**General statements about the basis for grains**

Basis patterns in grains are broadly similar from one year to the next.

Corn and soybean patterns are generally more regular than wheat.

Supply and demand of grain storage is one of the principal factors causing year-to-year variations in basis.

Transportation costs and availability is another factor causing year-to-year variations in basis.

Basis for grains is more erratic in inverted markets.

For hedgers, forecasting basis is a money-making opportunity.

Hedgers benefit from knowing basis patterns. The only way to know your basis is to track it over time. Don't just track the numbers. Take notes on events or issues that may have had an impact on your basis. This might include the closing of a local elevator, an increase in transportation rates, or the opening of a new processing facility, etc. Use the table in the exercise to track local basis in Commodity Challenge. Tracking basis daily is a healthy exercise, but weekly numbers should be good enough to indicate patterns.

***Further readings and resources***

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 #8

Use the basis tracking table to track the basis every day for your crop(s) in Commodity Challenge. Make copies if needed.

Basis Tracking Table

| Date | Cash Price | Futures Price | Futures Month | Basis | notes |
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