

# Using Commodity Futures as a Price Forecasting Tool

Commodity futures prices can serve as a mechanism for price discovery for either present or expected future prices. A market is defined as efficient if it accounts for all public and nonpublic information in determining an equilibrium price in the market. Commodity futures markets are often considered the most efficient markets in the price discovery process. That is, the price quoted for a commodity on the futures market is thought to be the best measure of the actual price, either current or future. Therefore, if you would like a good predictor of what prices will be four months from now, the deferred (four months out) futures price quote for that commodity may be the best and easiest price forecast.

## Forecasting current and future prices

Table 1 provides the corn closing future price quotes for Jan. 12, 2011. On that date these price quotes for corn could be thought of as forecast prices for the months listed in the left column. For example, if you wanted a forecast of what the price of corn was going to be for the United States in March 2011, you could use the March 2011 Chicago Board of Trade futures closing price of \$6.31 per bushel as a forecast price.

The ability to forecast price is valuable for several reasons. Knowing the expected grain price, for example, can help a producer

- evaluate decisions about grain storage;
- make forward pricing decisions, such as the one described below;
- decide which cropping alternative to plant in the spring; and
- plan annual cash flow and loan requests.

An example of how price forecasting can help when making forward pricing decisions: Based on Table 1, if in January 2011 you could forward price corn for May 2011 at \$6.38 per bushel, you would know that the offered price is about equal to the expected price. Typically, however, this will not be the case in forward pricing agreements because

**Table 1. Chicago Board of Trade corn futures price quotes (Jan. 12, 2011).**

Contract month	Year	Closing price
March	2011	\$6.31
May	2011	\$6.40
July	2011	\$6.44
September	2011	\$5.95
December	2011	\$5.60
March	2012	\$5.67
July	2012	\$5.78
December	2012	\$5.16

the entity offering the forward price contract requires a price discount to assume your price risk for a given period of time.

## How to forecast a local price

Agriculture producers and agribusinesses face a diverse array of marketing and production alternatives and must evaluate the impact of each marketing or production decision on their risk management plan. Different questions arise throughout the year, but the question of what price to expect is the most difficult to answer. No matter the time of year, however, expected price always influences the decision-making process. Other questions that arise for producers include

- before the growing season, which crop to plant given known input costs and expected harvest-time prices;
- during that same time and into crop maturity, whether to forward price a portion of the crop; and
- in the fall, whether to store the crop, or for cow/calf producers, whether to retain ownership on a portion of the calves beyond weaning.

Similarly, agribusinesses must determine price expectations to know what forward price to offer.

Commodity futures exchange markets provide a mechanism for price discovery on an aggregate level through arbitrage between multiple buyers and sellers. Price discovery at a given location is not as clearly defined, though, because local supply-and-demand relationships are not as well known. Historical basis provides a linkage between these two markets, however. Therefore, a simple, low-cost and relatively good predictor of the local cash

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price is the futures contract [month] price of interest adjusted for a multiple year average basis (cash price minus futures price) for that time. An expected price, where E denotes an expectation, can be found in the following way:

$$E[\text{Cash price}] = \text{Futures price} + E[\text{Basis}]$$

For example, suppose you are a corn producer who in January wants a corn price forecast for that December in a local market. You need this information to analyze the expected costs and returns of growing corn that year because, if you were to decide to raise corn, you would need to purchase seed in January. Your best expectation of that cash price might be that year's December corn futures price adjusted for an expected (say three-year average) basis. You know the previous three year's average basis for the area is  $-\$0.20$  per bushel. From Table 1, the December futures contract corn price is  $\$5.60$ . Thus, your expected local cash price is  $\$5.40$  per bushel [ $\$5.60 + (-\$0.20)$ ].

A similar procedure for forecasting prices can be used anytime for any offered futures contract. Suppose you are considering in January whether to plant corn or soybeans that year. If on Jan. 15 you wanted to forecast the December corn and November soybeans futures price for that year, you would simply obtain the December corn and November soybean futures price quotes on Jan. 15 and then add the expected basis.

Table 2 provides a detailed example of how anyone with access to local historical basis data can develop a cash price forecast. It illustrates forecasted corn prices for Lamar, Mo., as of January 2011. To derive the historical basis (C), average the basis (cash price minus futures price) for the previous three years. Then you can determine the expected, or forecast, cash price (D) by adding the relevant futures month contract (B) to the historical average basis (C) for the given month of interest (A).

Two points about Table 2: First, note that the futures contract month (in parentheses in column B) is kept constant until the expiration of the contract. This has been done for convenience, as industry practice may dictate rolling forward to the next deferred contract month at the beginning of the expiration month. For example, some may choose to use the July 2011 contract as the relevant futures month contract starting May 1, 2011, because May is considered the expiration month for the May 2011 corn futures contract. If doing so, then the historical May basis data should be computed as the cash price less the July futures. Second, the August–September period is an anomaly because many corn acres have yet to be harvested for new crop corn, while the southern growing region is in full harvest; or depending on weather, total harvest may be ahead or behind. Thus, August–September is a transition period, making any forecast for those months less reliable.

**Table 2. Forecasted corn prices for Lamar, Mo., in January 2011.**

Month	Futures <sup>1</sup>	Three-year historical basis	Expected cash price
A	B	C	D = B + C
<b>Old crop</b>			
(1) March 2011	\$7.12 (March)	-0.51	\$6.61
(2) April 2011	\$7.22 (May)	-0.60	\$6.62
(3) May 2011	\$7.22 (May)	-0.47	\$6.75
(4) June 2011	\$7.27 (July)	-0.59	\$6.68
(5) July 2011	\$7.27 (July)	-0.55	\$6.72
(6) August 2011	\$6.47 (Sept.)	+0.20	\$6.67
<b>New crop</b>			
(7) September 2011	\$6.47 (Sept.)	-0.50	\$5.97
(8) October 2011	\$5.99 (Dec.)	-0.80	\$5.19
(9) November 2011	\$5.99 (Dec.)	-0.76	\$5.23
(10) December 2011	\$5.99 (Dec.)	-0.71	\$5.28

<sup>1</sup> Relevant corn futures month contract in parentheses.

For business management of farm businesses, agribusinesses, wholesalers and retailers, forecasting local cash commodity prices is important to marketing or procurement. Timing is important when either selling or buying a commodity because of seasonal fluctuations in local and global prices. Farmers may price now, price later or forward price now for later delivery. Thus, knowing how current prices compare to potential cash prices is critical. Also, knowing if the forward price represents a fair price relative to historical patterns is important when being offered (seller) or offering (buyer) a forward price contract.

A local cash price forecast is also useful for making an informed store-versus-sell decision. For example, consider lines 1, 2 and 3 in Table 2. From column D, the between-month spread from March to April (line 2 minus line 1) is  $\$0.01$  per bushel and the between-month spread from March to May (line 3 minus line 1) is  $\$0.14$ . When the spread is greater than the cost of storage, farmers have a financial incentive to store until that month and forward contract today for later delivery.

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MU Extension publications G601 through G611 cover agricultural risk management. Topics include futures, options, hedging, basis and price forecasting.