Wheat Basis

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Basis are an essential part of marketing, yet basis are one of the least understood marketing concepts. Individuals who observe basis carefully are likely to make more profitable decisions. With knowledge of basis, individuals may more easily decide whether or not to accept a given price, whether or not to store a crop, and whether, when, and what delivery month to hedge. It is also easier to decide when to close or lift a hedge and when and how to turn an unusual basis situation into a profit opportunity. Basis are a key to effective marketing.

A basis is normally referred to as the difference between a cash price and a selected futures contract price. Basis for two locations are reported in this Fact Sheet: a north-central Oklahoma elevator (local basis) and the Arkansas River (river basis). Basis for the Texas Gulf and other locations are available at the web site http://agecon.okstate.edu/anderson (Wheat Articles link).

Basis

The term basis refers to the difference between two prices, normally a cash price minus a futures contract price.

In the Oklahoma hard red winter wheat market, the nearby Kansas City Board of Trade (KCBT) wheat futures contract price is subtracted from the appropriate cash price. Five wheat futures contracts occur: Mar, May, July, Sept, and Dec. The nearby futures contract is the futures contract closest to a delivery month. Starting at the beginning of the wheat marketing year (June), July is the nearby wheat contract. About July 1, Sept becomes the nearby wheat contract; about Sept 1, the nearby contract rolls over to the Dec contract; and so forth. In Tables 1 through 6, the nearby basis are enclosed in boxes.

The cash price offered to producers is determined by adding the basis to the "nearby" KCBT wheat contract price. Cash Price = Futures Contract Price + Basis, or Basis = Cash Price – Futures Contract Price.

Normally, local basis are negative so the cash price is calculated by subtracting the basis from the KCBT futures contract price. For example, assume that the current basis is -21¢ and that the nearby KCBT futures contract price is $4.50. The local wheat price would be $4.29 ($4.50 -$0.21 = $4.29).

If the basis is positive rather than negative, (like at the river or the gulf), the cash price is calculated by adding the basis to the underlying futures contract price. For example, assume that the river basis is 26¢ and the KCBT futures contract price is $4.50. The cash price would be $4.76 ($4.50 + $0.26

= $4.76). This is an academic way of saying, "To determine the cash price: if the basis is negative, subtract it and if it is positive, add it to the futures contract price."

Basis represent the costs to buy, store, handle, merchandise, and ship wheat, plus a profit margin. It is these costs and profit that make wheat prices different between locations. Locations such as Enid may have a higher basis than a local elevator because of reduced transportation and possibly handling costs. Shipping a unit train (110 cars; about 366,000 bushels) costs less per bushel than shipping the same wheat by truck (about 1,000 bushels/truck). Volume often allows elevators in Enid to pay a higher price for the wheat than local elevators in the state. The higher price is reflected in the basis.

Higher basis may also be the result of merchandising. Selling a unit train of wheat may cost less per bushel than selling many truckloads of wheat. A merchandiser may obtain a higher price for 366,000 bushels of wheat compared to only selling a few thousand bushels. The higher price may be reflected in the basis.

In parts of the U.S., Kansas City is the major market for hard red winter wheat. In Oklahoma, the major markets are the Texas or Louisiana Gulf markets. Thus, the basis at the Arkansas River or Texas Gulf ports are normally positive, which indicates that wheat has more value at the river or gulf ports, and that cash prices are higher than at Kansas City and the KCBT wheat contract prices.

The basis also reflects the market's need to buy wheat. During harvest, when producers are selling wheat, buyers normally buy more wheat than is needed to meet market demand. Since they do not need the wheat, they tend to lower the basis and therefore the cash price. During fall, winter, and spring, buyers often need more wheat than producers are selling, and they raise the basis, cash price relative to the KCBT contract price, to entice producers or local elevators to sell wheat they own.

Basis Tables

Historical basis are often used to estimate future basis or to determine if the current basis is above or below "normal." No magic basis tables are available to estimate future basis. In this Extension Fact Sheet, one-year, five-year, and 10-year average monthly basis are shown. Basis are calculated by

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subtracting daily KCBT wheat contract prices from daily cash wheat prices. To determine the average monthly basis, the daily basis is averaged for each month and each contract.

Tables 1 through 6 show monthly average basis for a north-central Oklahoma elevator and an elevator on the Arkansas River. Tables 1 and 4 are monthly average basis for the 2006/07 wheat marketing year. Tables 2 and 5 are five-year monthly average basis for the marketing years June 2002 through May 2007. Tables 3 and 6 are 10-year monthly average basis for the marketing years June 1997 through May 2007.

Basis are reported starting with June, which is the first month of the wheat marketing year. Basis are also shown for each KCBT wheat contract starting with March.

The nearby basis which will be used most often are shown in boxes. For example, if wheat is priced for November delivery, the nearby basis (-22¢) is the November basis for

Table 1. One-Year Monthly Average Basis 2006/2007: North-Central Oklahoma Cash Price minus KCBT Wheat Futures Contract Prices. (Basis are in cents per bushel).

	March	May	July	Sept	Dec
June	-45	-38	-27	-37	-45
July	-45	-36	-18	-30	-43
August	-41	-36	-13	-20	-35
Sept	-30	-22	-4	-10	-22
Oct	-36	-24	20	18	-24
Nov	-37	-31	5	6	-22
Dec	-28	-33	-17	-20	-17
Jan	-16	-25	-24	-30	-38
Feb	-5	-14	-17	-23	-32
Mar	-8	-4	-8	-17	-27
Apr	-35	-7	-6	-15	-27
May	-60	-13	-28	-38	-50

This information is provided for educational purposes only. Actual basis may differ.

Table 2. Five-Year Monthly Average Basis 2002/2007: North-Central Oklahoma Cash Price minus KCBT Wheat Futures Contract Prices. (Basis are in cents per bushel).

	March	May	July	Sept	Dec
June	-47	-44	-27	-34	-43
July	-43	-40	-22	-28	-39
August	-36	-31	-19	-21	-31
Sept	-25	-16	-1	-17	-23
Oct	-26	-17	8	6	-23
Nov	-23	-15	7	5	-20
Dec	-17	-10	3	0	-20
Jan	-15	-12	-7	-10	-19
Feb	-14	-13	-9	-13	-21
Mar	-21	-18	-16	-21	-30
Apr	-40	-19	-17	-23	-32
May	-47	-27	-26	-32	-41

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Table 3. Ten-Year Monthly Average Basis 1967/2007: North Central Oklahoma Cash Price minus KCBT Wheat Futures Contract Prices. (Basis are in cents per bushel).

	March	May	July	Sept	Dec
June	-58	-59	-34	-41	-52
July	-58	-59	-31	-37	-50
August	-53	-54	-50	-32	-45
Sept	-47	-45	-40	-31	-39
Oct	-42	-41	-31	-35	-34
Nov	-36	-35	-28	-31	-28
Dec	-29	-30	-27	-31	-27
Jan	-27	-29	-31	-36	-46
Feb	-25	-30	-32	-37	-47
Mar	-29	-30	-33	-40	-50
Apr	-58	-28	-32	-39	-49
May	-58	-31	-34	-41	-51

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Table 4. One-Year Monthly Average Basis 2006/2007: Arkansas River Cash Price minus KCBT Wheat Futures Contract Prices (Basis are in cents per bushel).

	March	May	July	Sept	Dec
June	0	7	18	9	0
July	-4	5	22	11	-3
August	-6	0	22	16	1
Sept	7	15	33	27	15
Oct	4	17	60	58	16
Nov	6	13	49	50	22
Dec	18	14	29	27	29
Jan	28	19	20	14	6
Feb	38	30	27	20	11
Mar	31	36	32	24	13
Apr	12	40	41	33	20
May	1	45	33	23	11

River prices provided by Peavey Grain Company.
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the Dec contract (November/Dec basis). This figure is found by going down to November and across to the Dec contract in Table 1.

The strength or weakness of the basis may help make marketing decisions. Because these terms are relative to the "normal" basis, the terms are difficult to define.

One method to define a normal basis is to use the monthly average basis shown in the 10-year basis table. For example, the 10-year average north-central Oklahoma average June/July contract basis is -34¢ (Table 3). The average 10-year June/July contract River basis is 11¢ (Table 6). These basis are found by going to the June month and across to the July contract.

The problem with using the 10-year average basis only is that it may not reflect potential changes in the marketing system and current supply and demand conditions. Another

method is to use the one-year, five-year, and 10-year average basis and then make an educated estimate. For example, the north-central Oklahoma November/Dec one-year average basis is -22¢, the five-year basis is -20¢, and the 10-year basis is -28¢.

Using the one-year average basis by itself produces an estimate that may be based on too few observations. Also, in the 2006/07 marketing year, stocks were below average, which tends to make the basis above average.

A review of USDA's Supply and Demand Estimates show that 2007/08 wheat marketing year wheat ending stocks will be about the same as 2006/07 ending stocks but less than the five- and 10-year averages. This implies that the November/Dec contract basis should be about the same as last year.

Weather problems in 2007 have resulted in reduced hard red winter wheat quantity and quality in Oklahoma and Kan-

sas. This fact could cause November/Dec basis to be above average.

One last factor is that the 2007 June/July contract basis was about 12 cents below average. Higher transportation, labor, and storage costs have reduced elevators' profit margin and the basis has been lowered to compensate, which would cause the November/Dec basis to be closer to the 10-year average compared to the one- or five-year average.

Using the three November/Dec average monthly basis (Tables 1, 2, and 3), -22¢, -20¢, and -28¢, one might estimate the average monthly November 2006 November/Dec basis to be -28¢.

As stated earlier, a perfect method for estimating a basis is not available. However, basis tables and knowledge about supply and demand expectations can be used to make an "educated guess."

Using Basis

Basis are essential information when making a marketing decision, pricing with a futures market contract, using futures option contracts, calculating what the market is offering, determining if a forward contract offer is good, determining the price difference between marketing locations, or using the futures market for information. The most common use of basis is in pricing with a futures market contract (hedge or option).

Market Strength

The basis indicates how strong the market is. A below average basis indicates that the market has sufficient wheat to meet needs. Therefore, a relatively lower price, because of a below-average basis, tends to make producers store rather than sell wheat. An above-average basis indicates that the market does not have enough wheat to meet needs and the price must be increased to get producers to sell.

Estimated Basis and Forward Contract Offer

On April 12, 2007, the KCBT July wheat contract price was $4.83. The local elevator was offering to forward contract for harvest delivery at a -40¢ basis or $4.43 ($4.83 - $0.40). At the same time a $4.80 July put option contract could be purchased for 27¢. Without a basis estimate, determining the expected price from the hedge, whether the forward contract price is a good basis offer or to calculate the expected minimum price from buying the KCBT 380 July put option contract is impossible.

During June 2006, the June/July-contract basis averaged -22¢ (Table 1), which implies that during June 2006, the price at this north central Oklahoma elevator averaged 22¢ less than the KCBT July wheat contract price. During the five-year period from June 2002 through May 2007, the June/July basis averaged -20¢ per bushel (Table 2). During the 10-year period from June 1997 through May 2007, the June/July basis averaged -28¢ per bushel (Table 3).

A definitive answer of what the June 2007 basis will be cannot be calculated. However, a good estimate is somewhere around a -28¢. Using a -28¢ estimate suggests that the elevator is taking a 13¢ risk factor with the forward contract basis.

Estimated Hedge Price

If a hedge is set in April by selling a KCBT July wheat contract ($4.83) and the projected -28¢ basis is used, the

Table 5. Five-Year Monthly Average Basis 2002/2007: Arkansas River Cash Price minus KCBT Wheat Futures Contract Prices (Basis are in cents per bushel).

	March	May	July	Sept	Dec
June	-1	2	19	12	4
July	1	4	21	16	6
August	7	12	24	22	12
Sept	18	27	42	28	21
Oct	19	27	52	50	22
Nov	23	31	52	50	26
Dec	29	36	49	46	27
Jan	33	35	41	37	29
Feb	32	32	37	32	24
Mar	23	27	29	23	14
Apr	10	29	30	25	16
May	6	24	26	20	11

River prices provided by Peavey Grain Company.
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Table 6. Ten-Year Monthly Average Basis 1967/2007: Arkansas River Cash Price minus KCBT Wheat Futures Contract Prices (Basis are in cents per bushel).

	March	May	July	Sept	Dec
June	-13	-14	11	3	-7
July	-14	-15	12	7	-6
August	-11	-11	-7	11	-2
Sept	-3	-1	4	13	5
Oct	3	5	14	10	11
Nov	11	12	19	16	19
Dec	18	17	20	16	22
Jan	20	17	16	10	1
Feb	20	16	14	8	-2
Mar	16	16	12	5	-5
Apr	-10	19	15	8	-2
May	-10	15	14	7	-3

River prices provided by Peavey Grain Company.
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expected hedge price is $4.55 ($4.83 - $0.28). If a minimum price is set in April by buying a $4.80 put option contract for $0.27, the expected minimum price is $4.25 ($4.80 - $0.28 basis - $0.27 option premium). Both the hedge price and minimum price are estimates because the actual June/July-contract basis will not be known until June. (For more information about hedging and options, see Extension Fact Sheets AGEC-548 and AGEC-549 at http://pods.dasnr.okstate.edu/docushare/dsweb/View/Collection-236).

A storage hedge is set by putting wheat in storage and selling a KCBT Dec wheat contract for each 5,000 bushels. Once a storage hedge is set, the gain or loss from the hedge is totally dependent on the basis.

For example, in June 20, 2006 the cash price was $4.46, the KCBT July wheat contract price was $4.73 (-$0.27 basis), and the KCBT Dec wheat contract price was $4.93 (-$0.47 basis). The wheat was placed in storage and a $4.93 KCBT Dec wheat contract was sold.

The expected net price from the storage hedge is the KCBT Dec contract price ($4.93) plus the expected basis. First, the expected basis must be determined (2006/07 wheat marketing basis were not used). The one-year average November/Dec basis was -25¢, the five-year average basis was -20¢, and the 10-year average monthly November/Dec basis was -$.28. Given relatively tight wheat stocks, the basis could be expected to be above the 10-year average so the estimated November/Dec basis is -25¢. Thus, the expected hedge price is $4.68 ($4.93 - $0.25).

To set the storage hedge, the wheat was placed in storage and the KCBT Dec wheat contract was sold for $4.93. On November 15, 2006 the cash price was $4.97, the KCBT Dec contract price was $5.22, and the basis was -25¢ ($4.97 - $5.22). The wheat was sold for $4.93. Subtracting the 25¢ futures contract loss for the cash prices produces a net price of $4.68, which is 22¢ above the June 20 price.

Another question to be answered is: "How would the price from selling wheat at harvest compare to the net price from completing a storage hedge?" The first method used to answer this question is to subtract the June price from the storage hedge net price ($4.68 - $4.46 = -$0.22).

The second method is to determine the basis change. The June/Dec-contract basis was -47¢. The November/Dec-contract basis was -25¢. The Dec basis increased 22¢ between June and November, thus the storage gain was 22¢.

The point is that the average basis gain between June and November shows the average gain for using storage hedges. The five-year average gain in north central Oklahoma has been 23¢ (-20¢ - (-43¢)). Over the same five-year period, storage and interest costs have averaged about $.05 per month or about $.25. This implies that storage hedge returns have averaged slightly less than storage and interest costs.

Price Difference Between Markets

The basis may be used to determine the average price difference between markets. For example, the average 2006 June/July basis for north central Oklahoma was -22¢ (Table 1) and the average 2006 June/July basis for the Arkansas River elevator was 18¢ (Table 4). Thus the River price averaged 40¢ higher than the north central elevator price.

The five-year June/July average basis was -27¢ for north-central Oklahoma and 19¢ for the river. This is a 46¢ difference and implies that, during the last five years in June, the river price averaged 46¢ higher than the north-central Oklahoma elevator price. If transportation and handling costs are less than 45¢ per bushel, the river may be an alternate market.

Summary

Basis and knowledge about what makes the basis change is essential for understanding the market, using futures contracts, and using futures option contracts. A combination of average basis may be used to estimate a basis. The 10-year average basis may be used to identify a long-run average. The five-year average basis may be used as additional information. The one-year average basis shows what the basis was last year and should be used to compare last year's supply and demand situation with the current conditions.

During the marketing year, the wheat basis tends to increase. In other words, cash prices tend to rise relative to future contract prices, thereby encouraging storage. If the basis is strong (above average), the market may be signaling to sell wheat rather than place it in storage. If the basis is weak (below average), the market may be signaling to store wheat rather than sell it. Thus, the basis performs a function of allocating commodities over time and space. With wheat, the basis is said to be allocating wheat and wheat storage so that the flow of wheat to the market is efficient and timely.