



Fact Sheet 497

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The local basis, defined as the cash price minus futures price, reflects important information about regional supply and demand for a commodity. Wheat basis estimates can be used by farmers, grain marketing firms, and millers to forecast regional prices, make production or storage decisions, or assess different grain purchasing alternatives. This fact sheet gives estimates of wheat basis and cash prices for seven regions in Maryland.

Methodology and Interpretation

Tables 1-7 display the 5-year average monthly wheat basis for seven different regions: Baltimore, western Maryland, central Maryland, southern Maryland, the upper Eastern Shore, the lower Eastern Shore, and southeastern Pennsylvania. The regional average cash price bid is collected each Wednesday by the Maryland Department of Agriculture and published in the Maryland Grain and Livestock Report. Regional prices were collected for the marketing years 1990-91, 1991-92, 1992-93, 1993-94, and 1994-95. For each day that a cash price is quoted, the

array of futures prices for that day is merged with the cash price to construct a profile of basis values. The basis is computed by taking the difference between a regional cash price and the futures price for a specific contract month. Monthly average basis values are computed for each contract month and then averaged over the 5 marketing years. The average and standard deviation (SD) of the basis for the 5 years is presented in the tables.

The columns for tables 1-7 represent the futures contract month, while table rows signify the calendar month of the marketing season. For example, in table 1, the intersection of the July row and the December column is -14 and would be read as follows: "In the calendar month of July, the average basis for the December futures contract is 14 cents under." Or, alternatively, "In July, the December futures price is on average 14 cents higher than the cash price." The nearby basis can be obtained from the lefthand entry in every row.

A standard deviation is associated with each average basis estimate; it represents the variability of the basis estimates. As a general rule, the actual basis is likely to fall within plus or minus one SD of the average basis. An optimistic basis is the average basis estimate plus the SD, while a pessimistic basis estimate is the average basis minus the SD. If the basis is normally distributed, 67 percent of the time the actual basis will fall within the bounds of the optimistic and pessimistic basis values.

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Using the Basis Tables: Some Examples

In this section, various examples are presented that show how the basis tables can be used.

(I) Harvest-Time Storage Decisions

For deciding whether to store grain after harvest, it is important to recognize the market signals that encourage storage. The first thing to examine is the current harvest-time basis. Is the current basis stronger or weaker than normal? A general rule, which can improve storage profitability, is to store wheat whenever the harvest-time basis is below the pessimistic basis level and sell wheat if the basis is above the optimistic basis value. A producer harvesting wheat in July would want to compare the current September basis with the average September basis in July. For Baltimore, the average September basis in July is 3 cents under with a SD of 11 (see table 1). A basis less than -14 (i.e., $-3-11$) is a good indicator to store. In contrast, a strong basis (i.e., higher than +8) is a good indicator to sell grain at harvest in lieu of storing.

The second piece of important information for analyzing a post-harvest storage decision is the current "storage futures price." Simply stated, the storage futures price represents what the futures market is willing to pay to have grain stored from a nearby contract month to a distant contract month; it is computed from the price spread between consecutive contracts (i.e., distant futures price minus nearby futures price). For example, suppose that in July the September and December wheat futures prices are 380 and 392 cents per bushel, respectively. Given these prices, the market is willing to pay 12 cents to store wheat from September to December. This price is for storing grain in delivery locations for the Chicago futures market, but it can be useful for determining storage prices for Maryland.

The basis tables can be used to calculate the average storage futures price. The average storage futures price can be obtained by taking the nearby basis and subtracting a

distant basis. Using Baltimore as an example, in the calendar month of July the average price of storage between September and December is as follows:

$$\begin{aligned} &\text{September basis in July} - \text{December basis in} \\ &\quad \text{July} \\ & -3 - (-14) = 11 \end{aligned}$$

Thus, in July the average price of storage is 11 cents per bushel for 3 months or roughly $3 \frac{2}{3}$ cents per month. On any given day one can obtain the current storage futures price by looking at the difference between consecutive futures contract prices. Higher than average storage prices indicate it is a good year to store, while lower than normal prices indicate that it is not good to store.

(II) Optimal Selling Month of Stored Grain

The basis tables can also be used to calculate the average return to grain storage. By placing wheat in storage after harvest and simultaneously selling a distant futures contract, a producer earns a return whenever the contracted basis increases over the season. Thus, instead of storage returns being dependent on cash price appreciation, a hedged storage position earns profits if a contract month basis increases over the season. Using Baltimore as an example, suppose a producer wants to store wheat from July to November. The futures side of this hedging decision is to sell the December contract in July and, when the cash grain is sold in November, buy back the December futures contract. The return to storage accounts for the short futures position and long cash position. On average, this return is as follows:

$$\begin{aligned} &\text{December basis in November} - \text{December} \\ &\quad \text{basis in July} \\ & 5 - (-14) = 19 \end{aligned}$$

Thus, on average, storing from July to November earns 19 cents per bushel when hedging with a December futures contract.

The tables can also be used to calculate the optimal month to sell stored grain. Assuming a producer harvests in July and has

a storage cost of 4 cents per month, average storage profit is equal to the average storage return (i.e., basis appreciation) for each month less storage cost. This is illustrated below using the Baltimore December wheat basis. Average return is given by the amount of appreciation in the December basis from July (i.e., harvest) until grain is sold. For example, the average return in October is 18 cents per bushel and reflects the difference between the December basis in October (4 cents) and the December basis in July (-14 cents).

Baltimore Average Wheat Storage Profit With 4 Cents/Month Storage Cost and Storing In July

Selling Month	Average Return Profit (Cents/Bushel)	Total Storage Cost (Cents/Bushel)	Average Profit (Cents/Bushel)
August	-2	4	-6
September	12	8	4
October	18	12	6
November	19	16	3

The producer's optimal selling month is October, since that month has the highest average profit. This only illustrates what the best strategy would be on average. For any given year, it may be best to sell grain at a different time during the season.

Price Information

Table 8 gives the average monthly wheat cash price for the seven regions. These values are reflected in figures 1-3 for various regions. Harvest-time wheat prices for July tend to be highest in the Baltimore and southeastern Pennsylvania regions, while the lowest prices occur in southern Maryland and the Upper Eastern Shore. The price differential at harvest tends to be about 25 cents per bushel from the high to low price regions. By November, this differential has increased to 30 cents, making interregional sales more profitable.

Table 1. Average Baltimore Wheat Basis: 1990-95.

Calendar Month	Futures Contract Month			
	July	September	December	March
June	-3 (5) ¹	-9 (4)	-20 (5)	-22 (2)
July		-3 (11)	-14 (10)	-16 (11)
August		-4 (8)	-16 (9)	-19 (9)
September			-2 (11)	-9 (11)
October			4 (9)	1 (11)
November			5 (12)	11 (7)
December				11 (7)
January				5 (13)
February				9 (13)

¹Standard deviation given in parentheses. All values are in cents per bushel.

Table 2. Average Western Maryland Wheat Basis: 1990-95.

Futures Contract Month

<i>Calendar Month</i>	<i>July</i>	<i>September</i>	<i>December</i>	<i>March</i>
June	-25 (17) ¹	-30 (18)	-41 (19)	-37 (7)
July		-30 (19)	-41 (17)	-38 (7)
August		-33 (19)	-45 (20)	-42 (10)
September			-35 (22)	-41 (19)
October			-37 (28)	-42 (24)
November			-31 (29)	-31 (22)
December				-31 (22)
January				-28 (14)
February				-26 (15)

¹Standard deviation given in parentheses. All values are in cents per bushel.

Table 3. Average Central Maryland Wheat Basis: 1990-95.

Futures Contract Month

<i>Calendar Month</i>	<i>July</i>	<i>September</i>	<i>December</i>	<i>March</i>
June	-13 (11) ¹	-18 (11)	-29 (10)	-29 (6)
July		-22 (13)	-32 (11)	-32 (4)
August		-23 (13)	-35 (14)	-35 (12)
September			-24 (18)	-30 (16)
October			-21 (17)	-26 (15)
November			-18 (17)	-22 (11)
December				-18 (12)
January				-24 (16)
February				-19 (17)

¹Standard deviation given in parentheses. All values are in cents per bushel.

Table 4. Average Southern Maryland Wheat Basis: 1990-95.

Futures Contract Month

<i>Calendar Month</i>	<i>July</i>	<i>September</i>	<i>December</i>	<i>March</i>
June	-30 (4) ¹	-36 (4)	-47 (4)	-49 (2)
July		-37 (7)	-47 (7)	-49 (5)
August		-36 (12)	-47 (13)	-48 (10)
September			-37 (14)	-43 (14)
October			-28 (6)	-34 (6)
November			-33 (12)	-38 (16)
December				-23 (10)
January				-33 (7)
February				-28 (18)

¹Standard deviation given in parentheses. All values are in cents per bushel.

Table 5. Average Upper Eastern Shore Wheat Basis: 1990-95.

Futures Contract Month

<i>Calendar Month</i>	<i>July</i>	<i>September</i>	<i>December</i>	<i>March</i>
June	-29 (3) ¹	-35 (3)	-45 (3)	-48 (3)
July		-36 (9)	-46 (8)	-48 (6)
August		-33 (9)	-45 (10)	-46 (9)
September			-38 (12)	-45 (11)
October			-29 (22)	-35 (17)
November			-21 (21)	-26 (20)
December				-26 (14)
January				-28 (18)
February				-23 (10)

¹Standard deviation given in parentheses. All values are in cents per bushel.

Table 6. Average Lower Eastern Shore Wheat Basis: 1990-95.

Futures Contract Month

<i>Calendar Month</i>	<i>July</i>	<i>September</i>	<i>December</i>	<i>March</i>
June	-31 (7) ¹	-36 (6)	-47 (6)	-48 (3)
July		-45 (2)	-33 (10)	-44 (8)
August		-29 (14)	-41 (14)	-41 (11)
September			-29 (12)	-35 (11)
October			-26 (10)	-31 (11)
November			-27 (9)	-31 (12)
December				-18 (5)
January				-15 (6)
February				-21 (22)

¹Standard deviation given in parentheses. All values are in cents per bushel.

Table 7. Average Southeastern Pennsylvania Wheat Basis: 1990-95.

Futures Contract Month

<i>Calendar Month</i>	<i>July</i>	<i>September</i>	<i>December</i>	<i>March</i>
June	3 (9) ¹	-2 (9)	-13 (11)	-14 (11)
July		-16 (16)	-27 (14)	-25 (4)
August		-17 (18)	-29 (19)	-26 (9)
September			-17 (16)	-23 (15)
October			-13 (17)	-23 (15)
November			-6 (16)	-10 (14)
December				-1 (9)
January				4 (7)
February				7 (9)

¹Standard deviation given in parentheses. All values are in cents per bushel.

Figure 1. Seasonal Average Cash Wheat Price for Western Maryland and Southeastern Pennsylvania:1990-1995

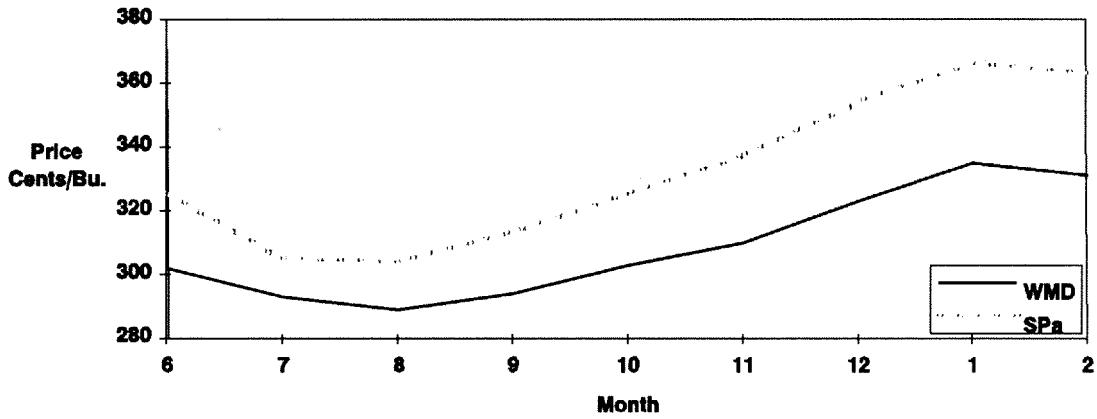


Figure 2. Seasonal Average Wheat Price for Southern, Central and Baltimore Maryland: 1990-95

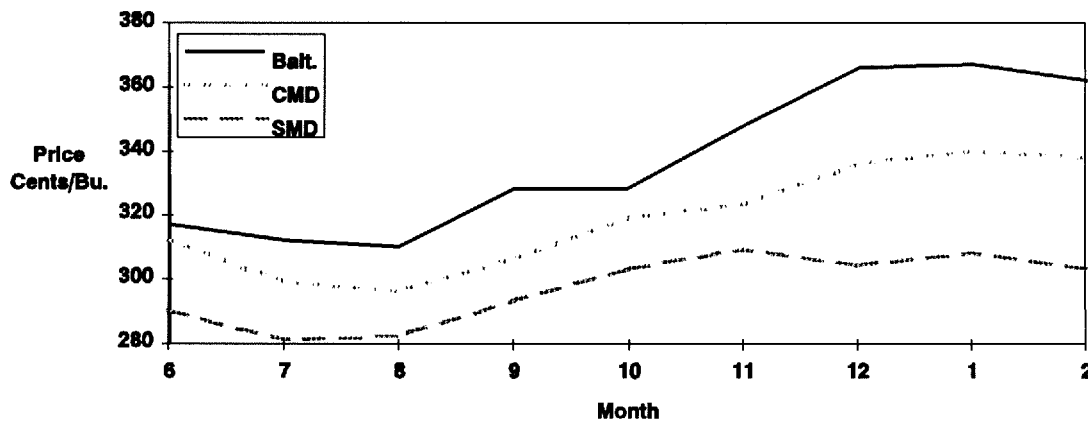


Figure 3. Seasonal Average Wheat Corn Price for Upper and Lower Eastern Shore Maryland: 1990-95

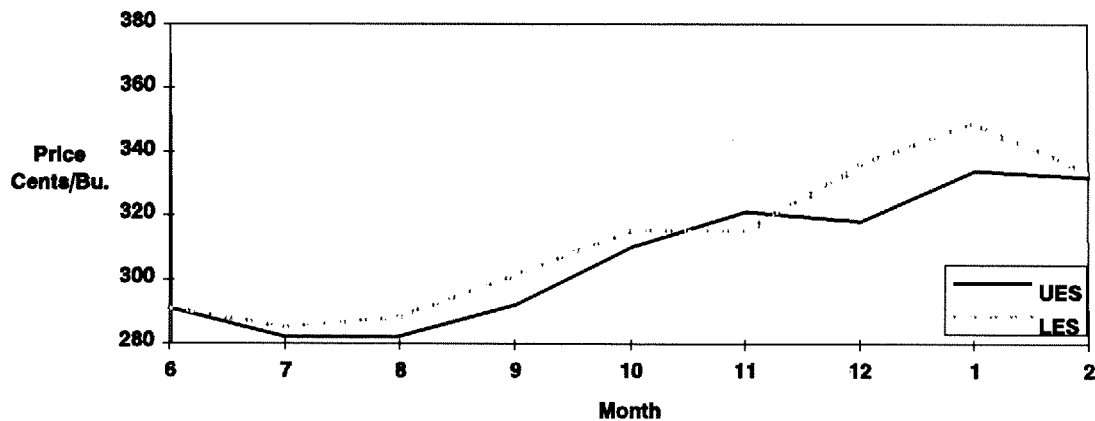


Table 8. Seasonal Average Cash Wheat Prices: 1990-95.

Month	Balt.	WMD	CMD	SMD	UES	LES	SPa.
June	317	302	312	290	291	291	326
July	312	293	299	281	282	285	305
August	310	289	296	282	282	288	304
September	328	294	306	293	292	301	313
October	328	303	319	303	310	315	325
November	348	310	323	309	321	315	337
December	366	323	336	304	318	336	354
January	367	335	340	308	334	349	366
February	362	331	338	303	332	333	363