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Maryland Wheat: Historical Basis and Price Information

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, processors and feed buyers to forecast regional prices, make production or storage decisions, or assess different grain purchasing alternatives. This fact sheet gives monthly average estimates of wheat basis and cash prices for three regions in Maryland.

In Maryland, wheat is often double cropped with short-season soybeans. The demand for soybeans and corn usually exceed the demand for wheat. As a result, there are less quoted cash bids for wheat on a regular basis than for corn and soybeans. Because of this situation, we only provide basis data for three markets, not five as with corn and soybeans. In addition, prices were only collected for the calendar months of June through November because of the lack of cash bids, on a regular basis, during the other six months.

Methodology and Interpretation

Tables 1-3 display the 9-year average monthly wheat basis for three regions in Maryland: Western Maryland, Central Maryland, and Lower Eastern Shore. 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. Weekly regional prices were collected for the marketing years 2004-05, 2005-06, 2006-07, 2007-08, 2008-09, 2009-10, 2010-11, 2011-12, and 2012-13. The crop year for wheat begins on June 1 and ends May 31. For each day 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 subtracting the futures price from the regional cash price for a specific contract month. Monthly average basis values are computed for each contract month and then averaged over the nine marketing years. The average and standard deviation (SD) of the basis for the nine years is presented in the tables.

The columns for Tables 1-3 represent the futures contract month while rows signify the calendar month of the marketing season. For example, in Table 1, the intersection of the June calendar row and the July futures column shows that the basis is -57 cents and would be read as follows: “In the calendar month of June, the cash price for wheat in Western Maryland averages 57 cents below the July futures price.” The nearby basis can be obtained from the lefthand entry in each row.

A standard deviation is associated with each average basis estimate; it represents the variability from the average basis estimates. As a general rule, the actual basis is likely to fall

within plus or minus one SD of the average basis 67% of the time. 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% of the time, the actual basis will fall within the bounds of the optimistic and pessimistic basis values. Figures 1-3 show graphs of the optimistic, average, and pessimistic basis for the typical harvest months of June, July, and August. In the calendar month of July, the cash price for wheat in Western Maryland averages 89 cents below the September futures price. The optimistic basis would be -23 cents (-89 + 66) and the pessimistic basis would be -155 cents (-89 - 66) as shown in Figure 1.

Using the Basis Tables: Some Examples

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

1. 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 grain after harvest whenever the harvest-time basis is below the pessimistic basis level and sell grain if the basis is above the optimistic basis value. A producer harvesting wheat in June would want to compare the current September basis with the average September basis in June. For Central Maryland, the average September basis in June is -71 cents with a standard deviation of 45 (see Table 2). A basis less than -116 cents (-71 - 45) is a good indicator to store. In contrast, a basis that is higher than -26 cents (-71 + 45) is a good indicator to sell grain at harvest in lieu of storing. If the current basis falls between the optimistic basis and the pessimistic basis, as it does 67% of the time, then there is not any marketing signal to store or to sell.

The second piece of important information for analyzing a post-harvest storage decision is comparing the current futures spread with historical futures spread. The futures spread represents what the futures market is willing to pay to have grain stored from a nearby contract month to a distant contract month and is computed from the price spread between consecutive contracts (i.e., distant futures price minus nearby futures price). For example, suppose that in June, the July and September futures wheat prices are $5.05 and $5.10 cents per bushel, respectively. Given these prices, the market is willing to pay 5 cents to store grain from July to September. This difference in futures contracts is most relevant for delivery locations near the Chicago futures exchange, but it can be useful for determining storage returns for Maryland.

To help farmers make harvest-time storage decisions, this current futures spread of 5 cents can be compared to the historical futures spread found in the basis tables. The historical futures spread can be obtained by taking the nearby basis and subtracting a distant basis. Using Central Maryland (Table 2), as an example, in the calendar month of June the historical futures spread between July and September is calculated as follows:

July basis in June – September basis in June = -53 – -71 = 18 cents

Thus, in June the historical futures spread is 18 cents per bushel for 2 months or 9 cents per month. Comparing it to the current futures spread of 5 cents or 2+ cents per month, indicates that it might be a good idea to sell at harvest. On any given day, one can obtain the current futures spread by looking at the difference between consecutive futures contract

prices. When the current futures spread is higher than historical futures spread, this indicates it is a good year to store; while lower than normal current futures spread (compared to the historical futures spread) indicate that it is not good to store.

2. Optimal Selling Month of Stored Grain

The basis tables can 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 increased 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 Central Maryland as an example, suppose a producer wants to store wheat from June to September. The futures side of this hedging decision is to sell the December contract in June and, when the cash grain is sold in September, 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:

December basis in September – December basis in June = -74 – -93 = 19 cents

Thus, on average, storing from June to September gains a farmer 19 cents per bushel when hedging with a December futures contract. However, in general, storing wheat is not profitable in Maryland.

The tables can also be used to calculate the optimal month to sell stored grain. As stated above, it usually is not profitable to store wheat, but it is still a helpful exercise for farmers to understand the change in basis as it relates to storage. If wheat is harvested in June and has a storage cost of 7 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 Lower Eastern Shore December wheat basis. Average return is computed from the amount of appreciation in the December basis from June (i.e., harvest) until grain is sold. For example, the average return in October is +9 cents per bushel, which reflects the difference between the December basis in June (-117 cents) and the December basis in October (-108 cents).

Lower Eastern Shore Wheat Storage Profit with 7 Cents/Month Storage Cost, December Futures Contract, and Storing Wheat in June

Selling Month	**Average Return** (¢/bushel)	**Storage Costs** (¢/bushel)	**Average Profit** (¢/bushel)
July	3	7	-4
August	0	14	-14
September	14	21	-7
October	9	28	-19
November	21	35	-14

The producer's 'optimal' selling month is July, since that is the month that the farmer loses the least money. 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.

The monthly storage costs were calculated as follows. It was assumed that the harvest time wheat price was $5.00/bushel and that the farmer had an outstanding loan with an interest rate of 9%. The opportunity cost of not reducing the principle of the loan with a payment is approximately 4 cents/month ($5.00 * .09/12). It was then assumed that the physical cost of drying and storage was an additional 3 cents/month, totaling 7 cents/month storage costs for wheat. Farmers should develop their own storage costs for this analysis.

Price Information

Figure 4 and Table 4 show the change in average Maryland wheat prices between June 2004 and November 2012. As mentioned, because of the infrequency of wheat cash bids through part of the marketing year, this graph only shows the calendar months of June through November for the crop years. Prices increased from a low of $2.84/bushel in November 2005 to a high of $8.44/bushel in August 2012. Typically grain markets are characterized as having sharp peaks with long valleys.

Table 4 shows average monthly increases in cash prices from July through selected storage months. As illustrated above, storage costs vary with the price of grain. However, at least three of these nine years were profitable for storage. Also, storage returns were highest when the grain was sold earlier in the storage season rather than holding to later, but even then, on average, when the cost of storage was included, storage was not profitable. However, storing grain without some type of forward pricing is speculation. There is no guarantee that the next nine years will be profitable for storing wheat.

Table 1. Average Western Maryland Wheat Basis, 2004 - 2012.

Calendar Month		2004-2012 Wheat Basis - Western MD (cents/bu)		
		July	September	December
June	avg	-57	-75	-97
	SD	55	57	58
July	avg		-89	-111
	SD		66	69
August	avg		-88	-111
	SD		79	81
September	avg			-79
	SD			65
October	avg			-74
	SD			67
November	avg			-66
	SD			66

Figure 1. Harvest Basis for Wheat (September futures, cents/ bushel) in Western Maryland, 2004 – 2012

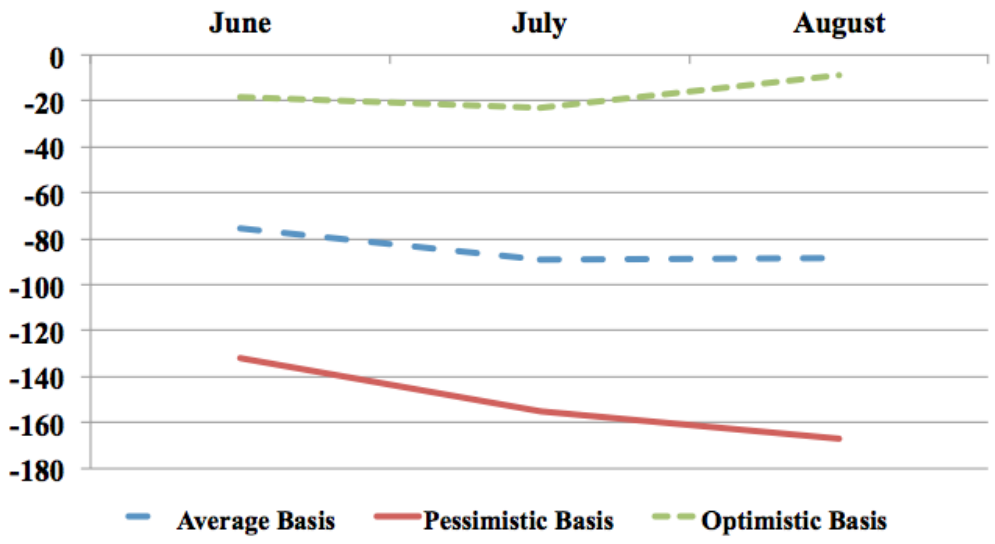


Table 2. Average Central Maryland Wheat Basis, 2004 - 2012.

Calendar Month		2004-2012 Wheat Basis - Central MD (cents/bu)		
		July	September	December
June	avg	-53	-71	-93
	SD	39	45	53
July	avg		-82	-103
	SD		80	84
August	avg		-78	-101
	SD		81	84
September	avg			-74
	SD			83
October	avg			-69
	SD			67
November	avg			-64
	SD			68

Figure 2. Harvest Basis for Wheat (September futures, cents/ bushel) in Central Maryland, 2004-2012.

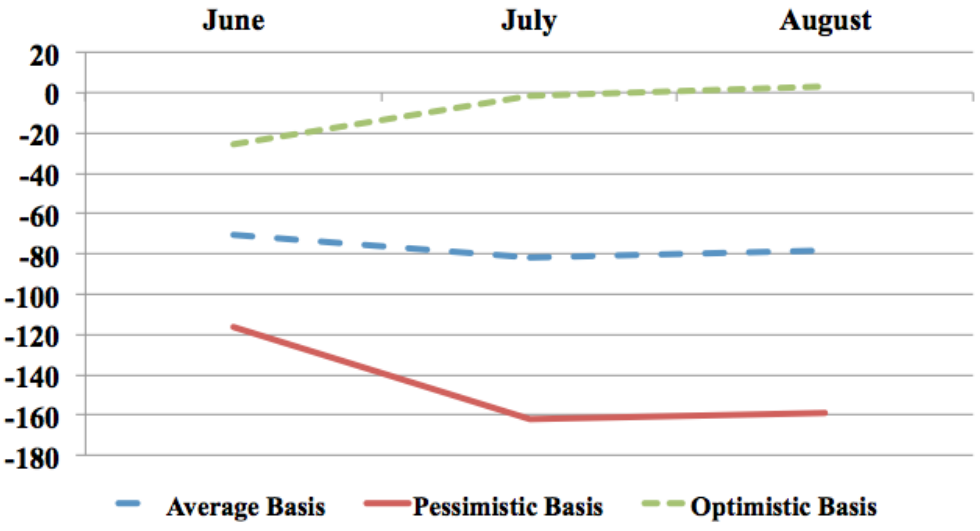


Table 3. Average Maryland's Lower Eastern Shore Wheat Basis, 2004 – 2012.

Calendar Month		2004-2012 Wheat Basis - MD's Lower Eastern Shore (cents/bu)		
		July	September	December
June	avg	-77	-94	-117
	SD	52	56	60
July	avg		-93	-114
	SD		66	71
August	avg		-95	-117
	SD		80	83
September	avg			-103
	SD			78
October	avg			-108
	SD			77
November	avg			-96
	SD			70

Figure 3. Harvest Basis for Wheat (September futures, cents/ bushel) in Maryland's Lower Eastern Shore, 2004-2012.

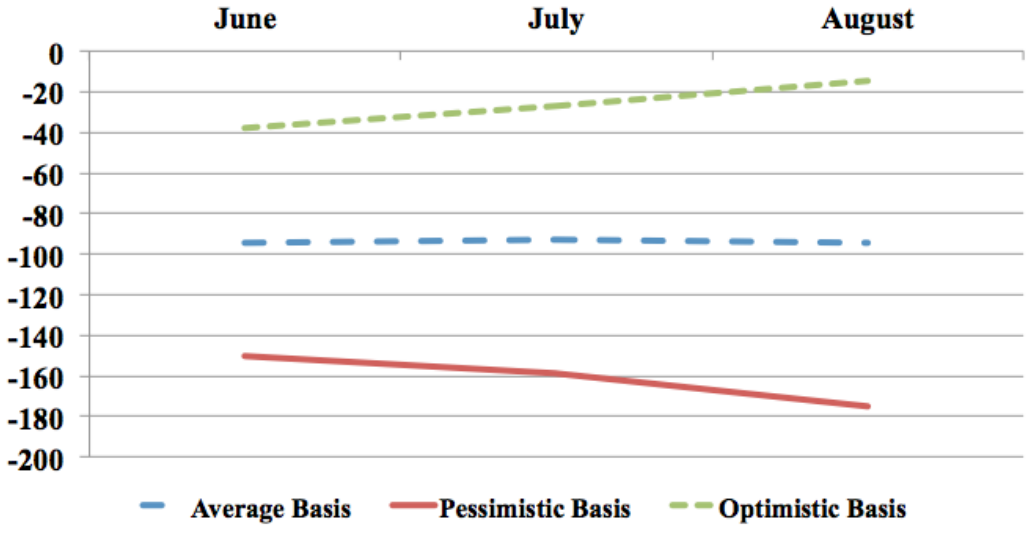
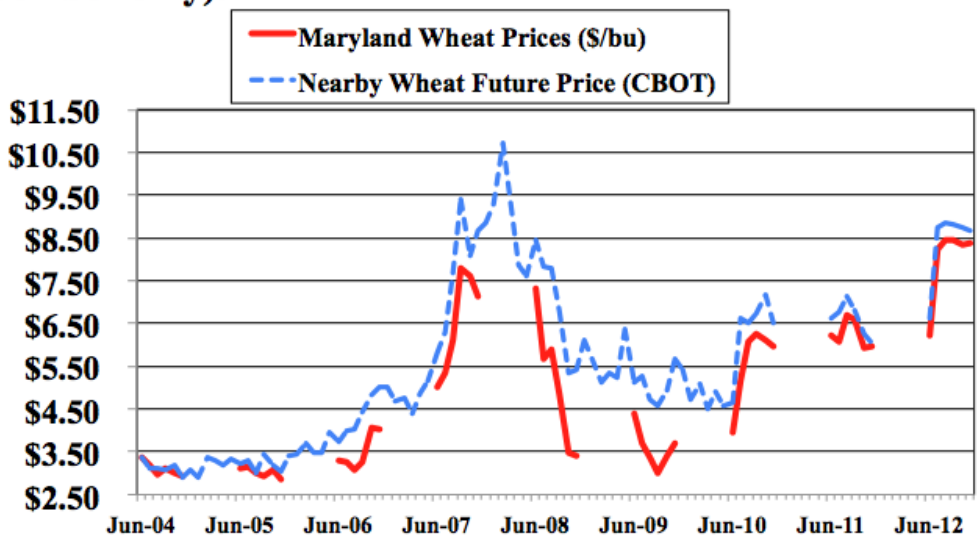


Figure 4. Monthly Wheat Prices ($/bushel) Averaged Across Three Maryland Markets, 2004 – 2012 (June through November only).



Source: Maryland Grain and Livestock Report. Prices computed as the simple average among Western MD, Central MD, and Lower Eastern Shore markets.

Table 4. Maryland Average Wheat Prices with Monthly Increases in Prices during the Storage Season, 2004 – 2012 ($/bushel).

Calendar Month	Maryland Average Wheat Prices ($/bu)									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	Average
June	3.38	3.10	3.28	5.02	7.32	4.39	3.96	6.21	6.20	4.76
July	3.18	3.14	3.26	5.33	5.67	3.71	5.17	6.06	8.23	4.86
August	2.98	3.00	3.08	6.11	5.89	3.37	6.09	6.71	8.44	5.07
September	3.10	2.92	3.26	7.79	4.88	3.01	6.26	6.59	8.44	5.14
October	3.01	3.09	4.07	7.61	3.47	3.40	6.10	5.94	8.36	5.01
November	2.93	2.84	4.03	7.13	3.41	3.70	5.98	5.97	8.39	4.93
	Average monthly increases in price ($/bu) from July to									
September	-0.04	-0.11	0.00	1.23	-0.39	-0.35	0.54	0.27	0.10	0.14
October	-0.06	-0.02	0.27	0.76	-0.73	-0.10	0.31	-0.04	0.04	0.05
November	-0.06	-0.07	0.19	0.45	-0.57	0.00	0.20	-0.02	0.04	0.02

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