

Price Forecasting Applications

To illustrate how the price models can be used in short-term market analysis, forecasting applications for two years beyond the period used to estimate the models are discussed—the completed 1997/98 crop year and the ongoing 1998/99 crop year as viewed in March 1999.

Corn

USDA corn-sector estimates for the 1997/98 crop year imply an ending stocks-to-use ratio of 14.9 percent. Corn stocks held by the Government at the end of 1997/98 equaled about 4 million bushels. Using these values, the corn price model estimated in this technical bulletin (equation 7a) implies a price of \$2.36 per bushel, slightly below (about 3 percent) the USDA-reported corn season average price of \$2.43.

For 1998/99, USDA projections in March 1999 implied an ending stocks-to-use ratio for corn of 18.3 percent. The USDA projected that government-owned corn stocks of 12 million bushels would be held at the end of the 1998/99 crop year. The corresponding corn model price estimate of \$2.23 per bushel compares with the March 1999 USDA-projected range of \$1.90 to \$2.10 per bushel. The difference between the USDA-projected price and the model estimate could be an indication of an unusually large model residual (nearly 12 percent) in the current year due to factors beyond the structure of the model. Alternatively, using the price model as a vehicle for making consistency checks among supply, demand, and price forecasts, the difference between the USDA-projected price and the model estimate could be indicative of the USDA-projected stocks in March 1999 (and thus the stocks-to-use ratio) being low relative to the projected price. In this circumstance, subsequent revisions in USDA corn-sector forecasts for the 1998/99 crop year would be expected to reduce use of corn and raise year-ending stocks.

Wheat

For wheat, the ending stocks-to-use ratio for 1997/98 was 31.4 percent. Wheat stocks owned by the Government, mostly in the Food Security Commodity Reserve, were 94 million bushels. Based on these data

and other USDA estimates for remaining independent variables in the wheat model (equation 7b), the wheat price model's estimate for the 1997/98 crop year is \$3.27 per bushel, compared with the USDA-reported season-average wheat price of \$3.38, a 3-percent difference.

In March 1999, USDA's wheat projections for 1998/99 implied an ending stocks-to-use ratio of 39.6 percent. USDA projected year-ending government-owned wheat stocks of 110 million bushels. The 1998 summer-quarter corn price was \$2.13 per bushel. Again, using other USDA projections for the remaining independent variables, the wheat price model's estimate for 1998/99 was \$2.66 per bushel, compared with the March 1999 USDA-projected range of \$2.65 to \$2.75 per bushel.

Confidence Intervals

Tables 3 and 4 show 1998/99 price forecasts and statistical confidence intervals over a range of different stocks-to-use ratios. The confidence intervals shown in tables 3 and 4 are contingent on the stocks-to-use ratio and other independent variables being the actual realized values and do not include forecast uncertainty of those variables. In making these model estimates, assumptions for other independent variables were the same as used above for the 1998/99 point estimates: 12 million bushels of corn held by the Government; government-owned wheat stocks at 110 million bushels; the summer-quarter corn price of \$2.13 per bushel; and remaining independent variables at their 1998/99 levels projected by USDA in March 1999, using data from that month's publications of *World Agricultural Supply and Demand Estimates* and *Grain: World Markets and Trade*.

The confidence intervals shown are not perfectly symmetric around the point estimates because they are derived in logarithms and then transformed to price levels. For stocks-to-use ratios projected in March 1999, a 95-percent confidence interval covers a range of about 18 cents per bushel for corn and 37 cents per bushel for wheat around their respective point estimates.

Table 3—Corn price model estimates for different stocks-to-use ratios*

Stocks-to-use ratio	Corn price model forecast	95-percent confidence interval
<i>Percent</i>	<i>--- Dollars per bushel ---</i>	
15	2.36	2.28 – 2.45
16	2.32	2.23 – 2.41
17	2.28	2.19 – 2.37
18	2.24	2.15 – 2.34
19	2.21	2.12 – 2.30
20	2.18	2.08 – 2.28
21	2.15	2.05 – 2.25
22	2.12	2.02 – 2.22
23	2.09	1.99 – 2.20
24	2.07	1.96 – 2.18
25	2.05	1.94 – 2.16

*Assumes CCC corn stocks at the end of 1998/99 equal to 12 million bushels, the USDA forecast in March 1999.

Table 4—Wheat price model estimates for different stocks-to-use ratios*

Stocks-to-use ratio	Wheat price model forecast	95-percent confidence interval
<i>Percent</i>	<i>--- Dollars per bushel ---</i>	
35	2.78	2.61 – 2.95
36	2.75	2.58 – 2.93
37	2.73	2.55 – 2.91
38	2.70	2.53 – 2.89
39	2.68	2.50 – 2.87
40	2.65	2.47 – 2.85
41	2.63	2.45 – 2.83
42	2.61	2.42 – 2.81
43	2.59	2.40 – 2.79
44	2.57	2.38 – 2.78
45	2.55	2.35 – 2.76

*Summer-quarter corn price was \$2.13; assumes other independent variables at 1998/99 levels forecast in March 1999 by USDA.