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The New Era of Crop Prices: A 15-Year Review

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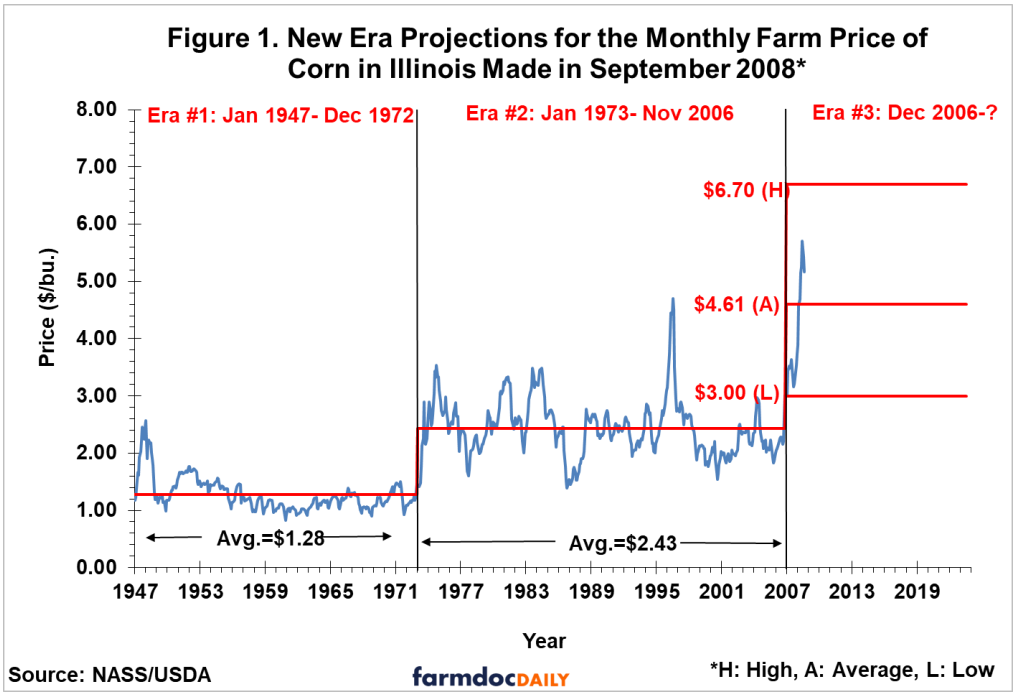
Crop prices are a key component of Corn Belt farm income and financial health. Farmers, landowners, and policymakers in the agricultural sector need to have some way of assessing long-term price prospects. Starting in the Fall of 2006, crop prices began a sharp rise. A key question at the time was whether the price run-up was a temporary spike or evidence of a permanent increase in the average level of prices. In Irwin and Good (2008, 2009), we argued that corn, soybean, and wheat prices had moved to a new, higher nominal price level. We concluded that the new range for prices would persist for an extended period, and we projected the likely average monthly price received in Illinois and the range in those monthly averages. We reviewed the accuracy of the projections in two earlier *farmdoc daily* articles (March 29, 2011; February 27, 2013). Given that more than a decade has passed since the last review, it is useful to revisit the accuracy of our original projections for the average price and trading range for corn, soybean, and wheat prices. In addition, almost exactly 15 years has passed since we made our original predictions, which provides more than a large enough sample to provide a definitive analysis of the accuracy of those predictions.

Analysis

We begin by reviewing the methodology used to project new era crop prices in our original publications. The prices used in all cases are the nominal (unadjusted for inflation) monthly average prices received by farmers as reported by the USDA's National Agricultural Statistics Service in the *Agricultural Prices* report. In Illinois, this series is based on information collected in monthly surveys of grain dealers, processors, and elevators that actively purchase grain from farmers. Surveyed firms report total quantities and gross value for grain purchased directly from farmers. The general principle used to determine the timing of transactions is the month when grain is purchased, that is, when cash changes hand between the firm and farmers. Hence, cash sales and forward contracts are reported for the month of delivery. The average price received estimate for a month is the total gross value across all surveyed firms divided by total quantities summed across all surveyed firms. A detailed discussion of the methodology used to compute the NASS average price received can be found in Irwin et al. (2006). For present purposes, the key is that the NASS monthly average price received series is not based directly on cash spot market prices. We use monthly average prices received because the prices are computed in a consistent manner going back to at least World War II.

Our original new era projections started with corn since we believed that the increase in prices that began in late 2006 was driven primarily by a dramatic expansion in the demand for corn ethanol. Ethanol usage in the U.S. rose from 3.5 billion gallons in 2004 to 9.7 billion gallons in 2008, nearly a threefold increase. The expansion was particularly strong in 2007-08, driven by record high crude oil prices and passage of the Renewable Fuels Standard (RFS) mandates in 2005 and 2007. We argued that the increase in ethanol demand was for all practical purposes permanent given the RFS mandates.

We then identified two previous price eras for corn and the change in average price between those two periods. As shown in Figure 1, the first era was the 26-year post-war period that extended from January 1947 through December 1972, when the average monthly corn price in Illinois was $1.28 per bushel. The second period, associated with the rapid increase in corn export demand in 1973, was the 34-year period that extended from January 1973 through November 2006, with an average monthly price of corn of $2.43. The projection of the average price in the new era made the simple assumption of an equal percentage price change that occurred between the previous two eras. The average price projection of $4.61, then, was calculated as [($2.43/$1.28) X $2.43] = $4.61. In our original publications, the projected average was reported as $4.60 due to an error in one of the monthly price observations, which subsequently was corrected.



The projection of the trading range for monthly corn prices in the new era that started in December 2006 was based on the ranges experienced during the first five years of the previous two eras. The lowest and highest average monthly prices during the first five years of each era was calculated as a percentage of the average price for the entire period. The percentages were averaged for the two periods and the average was used to project the trading range for monthly prices in the new era. Figure 1 reveals the trading range for the monthly farm price of corn in Illinois was projected to be $3.00 to $6.70 per bushel.

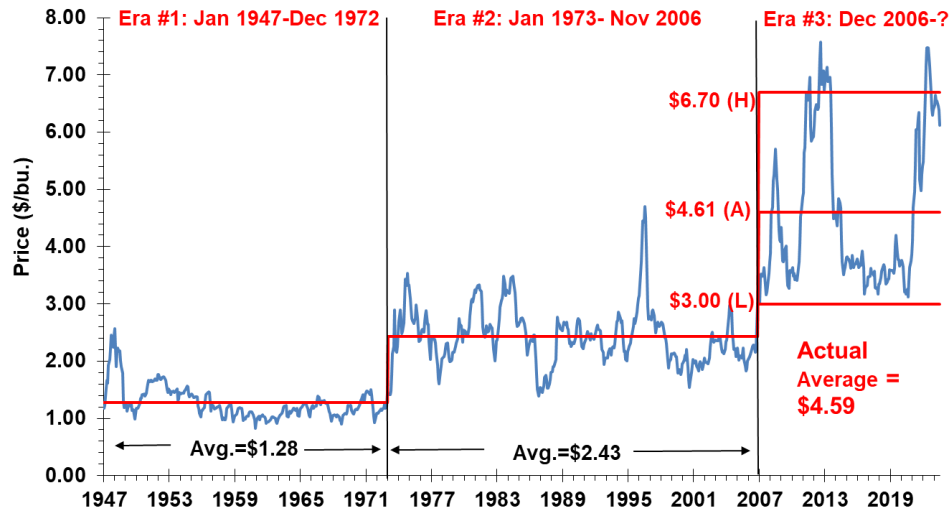
Figure 1 also highlights the limited sample of observations available when the original projections were made. The projections fundamentally reflected our assumptions that the corn ethanol boom would be lasting and that grain prices tended to move in a trading range for decades at a time. These two assumptions allowed us to project nominal prices in the new and emerging era.

In our original 2008 publication, the average price of soybeans was based on an expected ratio of soybean to corn prices of 2.5, resulting in a projection of $11.50 per bushel. We then lowered the ratio to 2.3 in our 2009 publication, resulting in a projection of $10.58. After a few years, it was clear that a ratio of 2.3 resulted in soybean price projections that were too low, so in our 2013 review we upped the ratio to 2.4, which raised the average soybean price projection to $11.04. In a similar fashion, the average price of wheat was based on an expected ratio of wheat to corn prices of 1.26, resulting in a projection of $5.80.

The average soybean price projection was the only one that varied from those made in the original 2008 publication. Finally, trading ranges for soybeans and wheat were projected using the same methodology as for corn. The projected trading range for the monthly farm price of soybeans in Illinois was $7.84 to $18.33 per bushel and the range for wheat was $3.30 to $10.15.

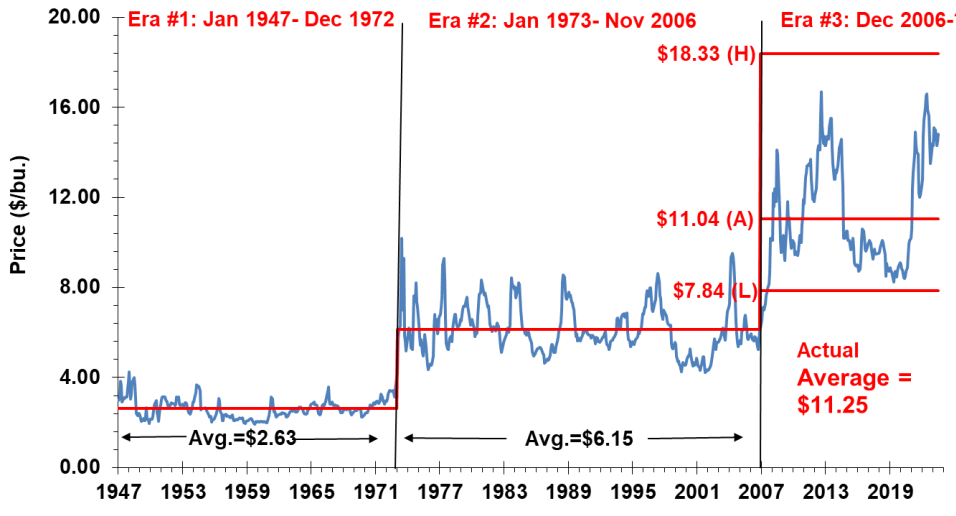
Figures 2, 3, and 4, respectively, show the monthly farm price of corn, soybeans, and wheat in Illinois from January 1947 through July 2023, the most recent month for which data is available. The projected new era trading range and average price level is also indicated on each chart. Note that the average price projection shown in Figure 2 for soybeans is the latest projection made in 2013. The charts also show the actual average corn, soybean, and wheat prices over the approximately 17-year period from December 2006 through July 2023. This is the available sample of prices in the new era to date.

Figure 2. Monthly Farm Price of Corn in Illinois, January 1947 - July 2023 and Projected Future Range

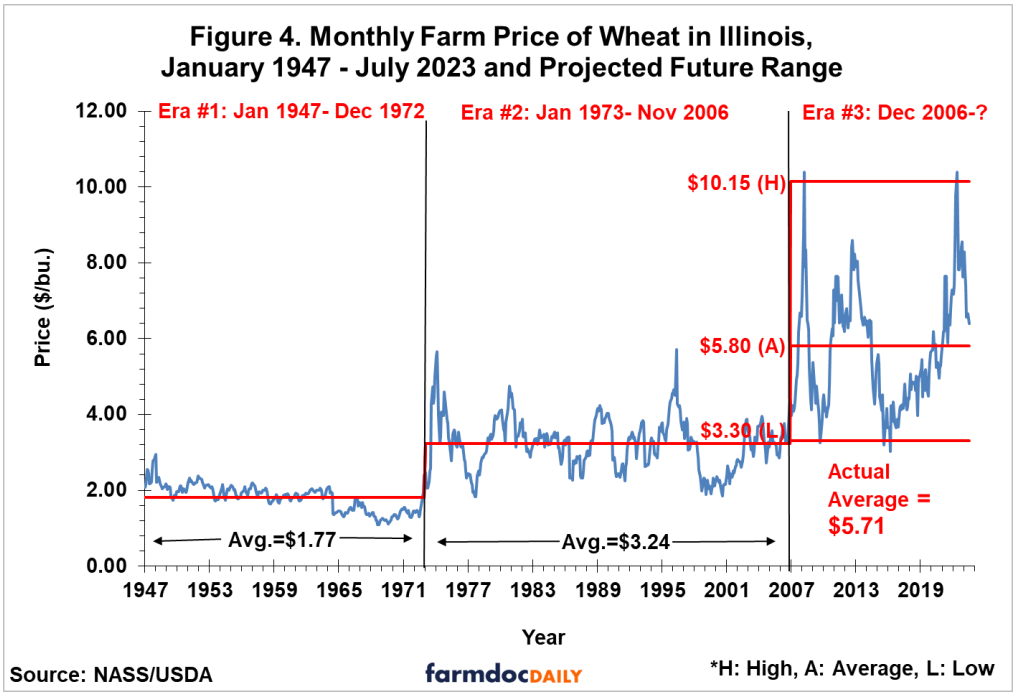


Source: NASS/USDA farmdocDAILY *H: High, A: Average, L: Low

Figure 3. Monthly Farm Price of Soybeans in Illinois, January 1947 - July 2023 and Projected Future Range



Source: NASS/USDA farmdocDAILY *H: High, A: Average, L: Low



Considering the simplicity of the methods used to project trading ranges and average price levels, plus the inherent difficulty of making such projections, the accuracy of the original projections is rather remarkable. The projection of the average price of corn, $4.61, is only two cents higher than the actual average of $4.59, or a forecast error of less than one-half of one percent. The trading range was also quite accurate on the low side but missed on the high side by as much as $0.75 per bushel. The projection of the average price of soybeans, $11.04, is only 21 cents lower than the actual average of $11.25, or a forecast error of about 1.9 percent. Once again, the trading range was also quite accurate on the low side but the high exceeded actual highs by about $1.50 per bushel. The projection of the average price of wheat, $5.80, is only 9 cents above the actual average of $5.71, or a forecast error of about 1.6 percent. The projected trading range for wheat was quite accurate on both the low and high side.

We have analyzed several other characteristics of new era prices in previous *farmdoc daily* articles, including: i) implications for trends in real (inflation adjusted) crop prices (April 19, 2011); ii) the distribution of crop prices and marketing rules-of-thumb (February 28, 2013); iii) the length of time that prices may stay above or below average (November 7, 2013); and iv) the relationship of new era projections to stock-to-use scenarios (April 22, 2016). We intend to revisit some of these topics in future articles.

Implications

The level of long-term average crop prices is central to farm incomes, rents, land values, and expenditures for commodity support programs. One approach to the problem of projecting long-term averages is to argue that it is not possible to do better than using the most recent price observation as the projection. While this has theoretical merit, the evidence presented here and in earlier *farmdoc daily* articles indicates that one can do better than such a naïve approach. In this article, we reviewed the last 17 years of Illinois corn, soybean, and wheat prices to evaluate "new era" projections that we first made in September 2008. Our original projections of the average monthly prices for the three crops turned out to be remarkably accurate, with less than two percent error in each case. Projected trading ranges were not as accurate in all cases, but still provided useful bounds on price movements. In sum, it is clear that a truly new era in nominal corn, soybeans, and wheat prices started in the Fall of 2006 and that this era has persisted to the present time. Until there is conclusive evidence of another major shift in crop demand, our original monthly average price projections of $4.61, $11.04, and $5.80 for corn, soybeans, and wheat, respectively, in Illinois remain useful benchmarks for long-term planning purposes. Alternatively, one could use the actual average prices over December 2006 through July 2023 for corn, soybeans, and

wheat of $4.59, $11.25, and $5.71, respectively. How long this new era will last is an open question. What we can say for sure is that it is nearly 17 years and counting.

References

Irwin, S. and D. Good. "The New Era of Corn and Soybean Prices Is Still Alive and Kicking." *farmdoc daily* (6):78, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, April 22, 2016.

Irwin, S., and D. Good. "How Long Should We Expect Corn and Soybean Prices to Remain Above or Below Average?" *farmdoc daily* (3):213, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, November 7, 2013.

Irwin, S. and D. Good. "New Era Crop Price Distributions and Marketing the 2012 and 2013 Crops." *farmdoc daily* (3):39, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, February 28, 2013.

Irwin, S., and D. Good. "The New Era of Crop Prices - A Five-Year Review." *farmdoc daily* (3):38, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, February 27, 2013.

Irwin, S. and D. Good. "A New Era in Real Agricultural Prices?" *farmdoc daily* (1):45, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, April 19, 2011.

Irwin, S., and D. Good. "A New Era in Crop Prices?" *farmdoc daily* (1):27, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, March 29, 2011.

Irwin, S., and D. Good. "The New Era of Corn, Soybean, and Wheat Prices." MOBR 08-04, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, September 2, 2008.

Irwin, S.H., and D.L. Good. "Market Instability in a New Era of Corn, Soybean, and Wheat Prices." *Choices*, 1st Quarter 2009, 24(1). http://www.choicesmagazine.org/UserFiles/file/article_56.pdf.

Irwin, S.H., D.L. Good, J. Martines-Filho, and R.M. Batts. "The Pricing Performance of Market Advisory Services in Corn and Soybeans Over 1995-2004." AgMAS Project Research Report 2006-02, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, March 2006.