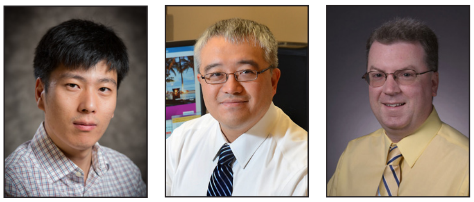
$$

Ag Decision Maker

$$

A Business Newsletter for Agriculture

Vol. 21, No. 12 www.extension.iastate.edu/agdm October 2017



Handbook updates

For those of you subscribing to the handbook, the following updates are included.

Change in Corn Prices by Two-week Period, 2007-2016 – A2-17 (1 page)

Change in Soybean Prices by Two-week Period, 2007-2016 – A2-18 (1 page)

Lease Supplement for Obtaining Conservation Practices and Controlling Soil Loss – C2-08 (3 pages)

Farmland Value Survey (REALTORS® Land Institute) – C2-75 (2 pages)

Please add these files to your handbook and remove the out-of-date material.

continued on page 6

Inside . . .

Are agricultural professionals' farmland value and crop price forecasts consistent?

By Wendong Zhang, extension econonmist, (515) 294-2536, wdzhang@iastate.edu; Wei Zhang, assistant professor of marketing, (515) 294-7911, wtzhang@iastate.edu; and Chad Hart, extension econonmist, (515) 294-9911, chart@iastate.edu

While agricultural commodity futures and options markets are typically used to gauge future prices, until recently, few surveys existed that consistently and systematically solicit opinions of agricultural professionals or producers regarding future farmland price changes. Using agricultural professionals' forecasts of future farmland values and corn and soybean cash prices for their service area at the 2016 ISU Soil Management Land Valuation (SMLV) conference, we analyze whether their land and corresponding crop price expectations are consistent.

Data

Sponsored by Iowa State University, the SMLV conference is regularly attended by farm managers, rural appraisers, real estate brokers, and others interested in the land market in Iowa and across the Midwest. Since 1964, every participant has had an opportunity to "gaze into their crystal ball" and provide their estimates of future corn and soybean prices and land values in Iowa. At the 2016 conference, 162 out of 280 conference participants fully completed and returned their estimates, providing our study sample.

Consistency between crop and land price forecasts

We compare the reported corn price forecast by a respondent with their reported land price forecast for 2016 and 2020. Figure 1 shows a scatterplot of respondents' corn price forecasts with same-year land price forecasts. A visual examination of Figure 1 seems to suggest that there is no obvious correlation or clear trend between the corn price and land price forecasts. The lack of correlation is true for both

continued on page 2

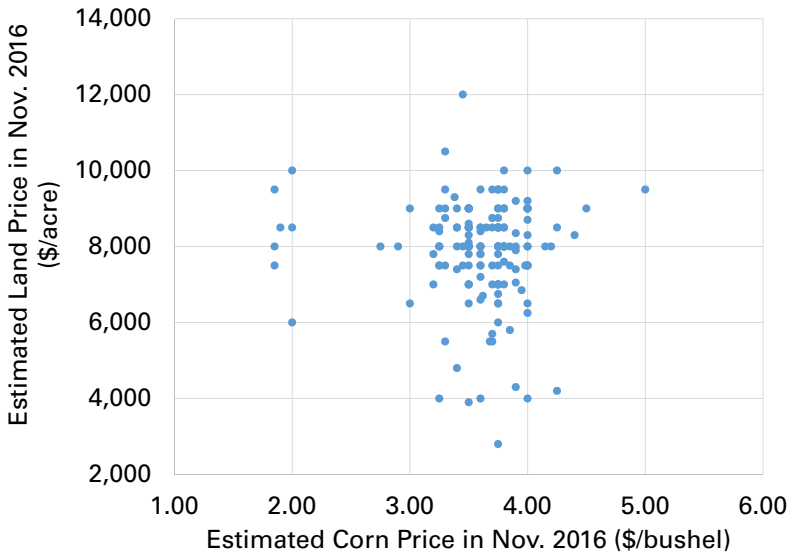
Iowa State University
Extension and Outreach

Ag Decision Maker is compiled by extension ag economists
Ann Johanns
extension program specialist
aholste@iastate.edu, 641-732-5574

Are agricultural professionals' farmland value and crop price forecasts consistent?, continued from page 1

2016 and 2020 values. It seems that the participating agricultural professionals' corn price forecasts are more clustered between $3.00 and $4.00/bushel, however, their land price forecasts have a much larger variability, ranging from $4,000 to $10,000/acre.

Figure 1. Scatterplot between expected corn and land prices



It seems logical to suggest that agricultural professionals seem to rely on corn futures prices when reporting corn price forecasts, and thus report a fairly similar value. In contrast, these participants may rely more on the recent farmland transactions or appraisals in their local service areas as a reference for the future farmland market. We ask participants to forecast land prices for their service area (i.e., the area in which they provide professional service), which helps explain the wide range in their responses for the forecasted land prices. In other words, the agricultural professionals may rely on different information when forecasting crop and land prices—the crop futures market could easily be used as a benchmark when forecasting crop prices, however, land price is driven by a host of other characteristics beyond crop prices, including most notably land quality, crop yields, and crop-livestock mix, as well as local market characteristics, like proximity to urban areas.

Cross-market correlation in forecasted price changes

Differences in information sources and systems resulted in the seemingly apparent lack of correlation between forecasted crop prices and land prices. However, this does not necessarily mean that they are inconsistent, as agricultural professionals' expected land market fluctuations may still be correlated with expected crop market fluctuations. Table 1 shows the results of regressing the percentage change in expected land prices on corresponding percentage change in corn or soybean prices for the same period. Two things are worth noting from this table—first, Models 3 and 4 (the longer range models) yield a significantly higher coefficient when compared to Models 1 and 2 (the short-term models) for corresponding crop price changes. For example, while a one-percent increase in expected corn price from November 2016 to 2017 leads to only 0.23 percent increase in expected land price for that period, the implied marginal impact of expected corn

Table 1. Regression analysis of short-term vs. medium-term crop and land expectations

	Dependent variable: land change 2016 to 2017		Dependent variable: land change 2016 to 2020	
	Model 1	**Model 2**	**Model 3**	**Model 4**
Corn Change	**0.2339 (0.0757)**		**0.3246 (0.0573)**	
Soybean Change		**0.2763 (0.0837)**		**0.4041 (0.0640)**
Intercept	**-3.9122 (0.7228)**	**-3.4439 (0.6606)**	0.7140 (1.4784)	1.7725 (1.2713)
R-squared	0.0563	0.0638	0.1670	0.1993
# observations	162	162	162	162

Note: bold coefficients denote those coefficients that are statistically significant at the five percent level.

continued on page 3

Are agricultural professionals' farmland value and crop price forecasts consistent?, continued from page 2

price hikes on expected land price changes from November 2016 to 2020 grows from 0.23 percent to 0.32 percent. This is almost a 40 percent increase from short-term to medium-term. Secondly, the regression results also reveal higher coefficients for the models which use expected price changes for soybeans as opposed to corn as the regressors. This is likely a reflection of agricultural professionals recognizing the growing significance of soybeans in the crop acreage mix in Iowa.

Economic theory states that the value of land is the net present value of future income flows generated by that land parcel. Put simply, land value can be thought of as localized net income divided by universal interest rates. Because of the substantial variation in crop-livestock mix across Iowa, the relative importance of crop price or crop income in driving net income as well as land value in a particular crop reporting district varies significantly across Iowa's nine crop reporting districts. In light of this, we segment the nine crop reporting districts into two distinct groups—crop-intensive districts in which crop production and crop income play a relatively larger role in driving net income, including Northwest, North Central, West Central, and Central Iowa; and less-crop-intensive districts in which crop income plays a relatively smaller role and other sources of income, such as livestock income or pasture production, can provide more influence.

Table 2 replicates the regressions, but we estimate the regressions separately for crop-intensive districts and less-crop-intensive districts. The regressions focusing on expected land price change from November 2016 to 2017 reveal that expected corn price change in the short-term is only relevant in driving expected future land price movements for crop-intensive districts. In crop-intensive districts, a one-percent increase in expected corn prices from November 2016 to November 2017 would lead to a 0.25 percent increase in the corresponding expected land prices, which is substantially higher than the average marginal effect for all nine districts reported in Table 1. In contrast, the expected short-term crop price changes in less-crop-intensive districts are not critical drivers of agricultural professionals' expected land price changes. Secondly, even for less-crop-intensive districts, the medium-to-long-term linkages between crop price change and expected land price shifts is substantially stronger and significant, a one-percent increase in expected corn prices from November 2016 to November 2020 would lead to 0.29 percent increase in the corresponding expected land prices. The marginal effects for crop-intensive districts are substantially stronger than that for less-crop-intensive districts.

Conclusion

Our results demonstrate a positive correlation between expected crop price and expected land price changes, suggesting that these two forecasts are consistent and the predictions from agricultural professional respondents are somewhat foreseeable. More importantly, we find that while the correlation between the six-month, short-term land and crop price forecasts are relatively small, the medium-term land value forecast is more strongly associated with corresponding corn and soybean price forecasts. In addition, our results reveal a stronger correlation between these two forecasts for the crop reporting districts with more intensive crop production and thus heavier reliance on crop income as a source for farm income.

Table 2. Regression analysis of short-term vs. medium-term corn and land expectations for crop-intensive vs. less-crop-intensive districts

	Dependent variable: land change 2016 to 2017		Dependent variable: land change 2016 to 2020	
	Model 1 – crop-intensive	Model 2 – less-crop-intensive	Model 3 – crop-intensive	Model 4 – less-crop-intensive
Corn Change	**0.2537 (0.0777)**	**0.1948 (0.1544)**	**0.3493 (0.0765)**	**0.2888 (0.0878)**
Intercept	**-3.7604 (0.7906)**	**-4.0622 (1.3398)**	-0.0196 (2.0494)	1.6769 (2.1460)
R-squared	0.1058	0.0229	0.1880	0.1372
# observations	92	70	92	70

Note: bold coefficients denote those coefficients that are statistically significant at the five percent level.