

Farmland Value Expectation and Its Impact on Farmland Market: Evidence from Surveys of Agricultural Professionals since 1964

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Introduction

- Farmland is critically important for producers and the ag economy
 - ✓ The **most significant asset** on the agricultural sector
 - ✓ 80% of the total value of U.S. agricultural assets.
- Impact of farmland value expectation on economic activity & ag economy is rarely examined
 - ✓ Studied in many areas of Economics: Urban Economics (Shiller (2007)), Energy Economics (Kilian (2009)), etc.
 - ✓ Only exception: Kuethe (2016) examined farmland value expectation formation using Fed Reserve data
- This paper used a unique data to examine the effects of farmland value expectation on future farmland value and sale activity.

Hypothesis

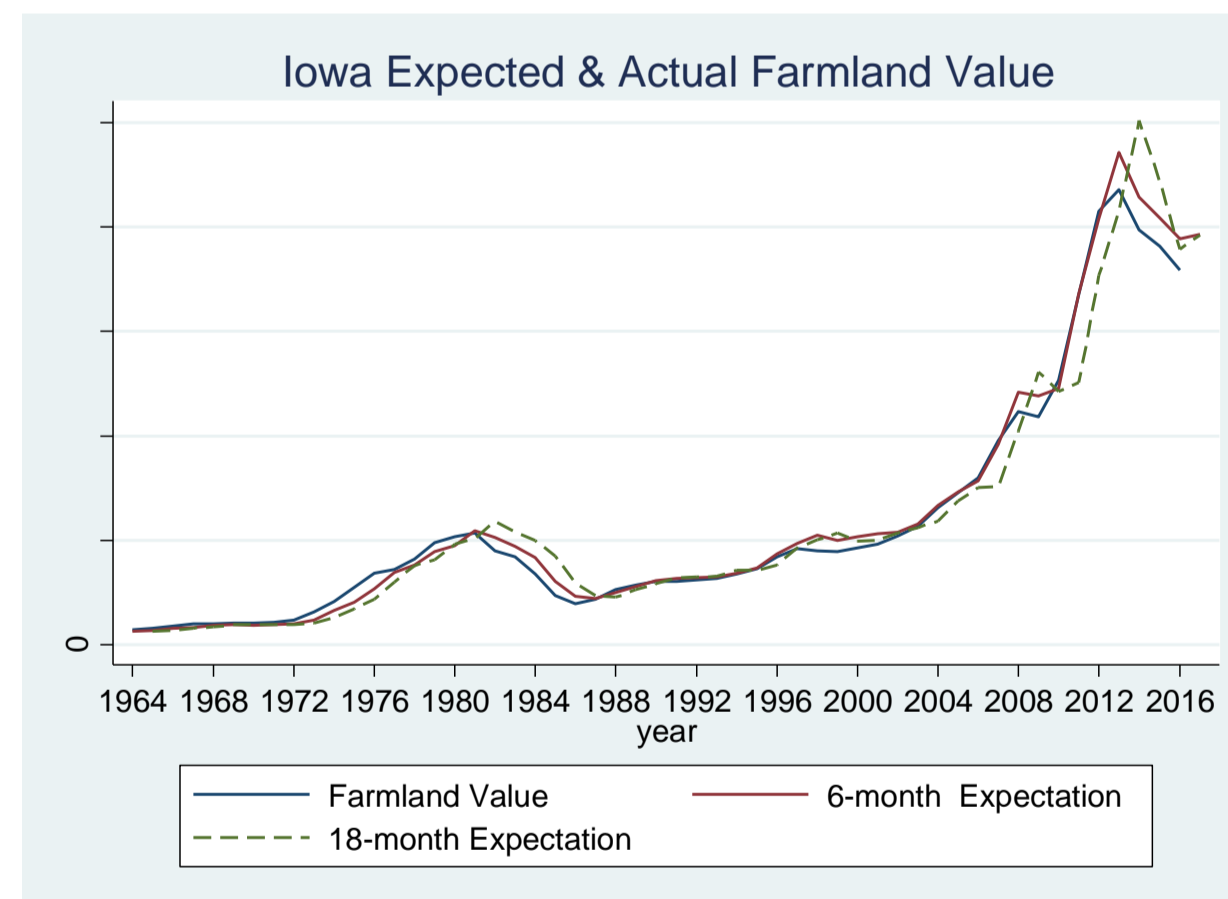
Higher expectation → Higher future farmland value and more sales

- Hypothesis 1:** Higher farmland value expectation tends to lead to a higher farmland value in the future.
 - ✓ Higher expectation → higher buying intention → higher farmland value
- Hypothesis 2:** Higher farmland value expectation tends to lead to higher farmland sale activities in the future.
 - ✓ Higher expectation → more active speculators → higher sale activities

Data

Unique annual on-site survey data on farmland value expectation in Iowa

- ✓ Long time series: 1964 to 2017 - 1980s crisis and late - 2000s hike



- ✓ Quantitative expectations reported by experts
- ✓ Different terms of expectation: 6 months, 18 months and 5, 15-year
- ✓ not only relevant for Iowa: Iowa market movements are often leading indicators for Midwest & US

Survey Questionnaire Example – as of May 2017



Part I: Short term expectation

| | LAND (\$/ACRE) | CORN CASH PRICE (\$/BU) | SOYBEAN CASH PRICE (\$/BU) |
|------------------|----------------------|-------------------------|----------------------------|
| November 1, 2017 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| November 1, 2018 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| November 1, 2020 | <input type="text"/> | <input type="text"/> | <input type="text"/> |

Part II: Long term expectation

| | LAND PRICE (\$/ACRE) |
|------------------|----------------------|
| November 1, 2025 | <input type="text"/> |
| November 1, 2040 | <input type="text"/> |

Methods

- Following the framework of Falk and Lee (1998) and Weersink et al. (1999), the model is:

$$\Delta \text{Farmlandvalue}_t = \beta_0 + \beta_1 * \Delta \text{Expectation}_t + \beta_2 * \Delta \text{Interestrates}_t + \beta_3 * \Delta \text{Farmlandreturn}_t$$
- ✓ **New addition: experts' farmland value expectation**
- ✓ Data is adjusted for inflation and logarithm form is taken on the variables
- ✓ Differences are taken to deal with nonstationarity

- $\Delta \text{Variable}_t = \text{Variable}_t - \text{Variable}_{t-1}$
- ✓ Lagged term are added to allow for autocorrelation when regressing on sale activity:

$$\Delta \text{Saleactivities}_t = \beta_0 + \beta_1 * \Delta \text{Expectation}_t + \beta_2 * \Delta \text{Interestrates}_t + \beta_3 * \Delta \text{Farmlandreturn}_t + \beta_4 * \Delta \text{Saleactivities}_t$$

- Robustness check**
 - ✓ Various variables are used to proxy for farmland return
 - Crop price
 - Crop basis
 - Cash rent
 - ✓ Both 6 months and 18 months expectation are examined

Results

How expectation affect farmland market?

Part I: Impact on future farmland value 6 month later

| | (1) | (2) | (3) |
|----------------------------|----------|----------|----------|
| Farmland value Expectation | 0.842*** | 0.877*** | 1.071*** |
| Interest rate | -0.0102 | -0.0145* | -0.0118 |
| Crop price | 0.181*** | | |
| Crop basis | | -0.516** | |
| Cash rent | | | -0.388* |
| Constant | 0.00358 | -0.00515 | -0.00385 |
| R-Square | 0.834 | 0.779 | 0.773 |

Note: Independent variables has been differenced and adjusted as in the regression model. The expectation is for 6-month.

Part II: Impact on future farmland sale activities

| | (1) | (2) | (3) |
|----------------------------|-----------|----------|----------|
| Lagged sale activities | -0.595*** | -0.321** | -0.524** |
| Farmland value Expectation | 1.701** | 1.426** | 2.946** |
| Interest rate | -0.142 | -0.265 | -0.456 |
| Crop price | 0.759** | | |
| Crop basis | | -3.479** | |
| Cash rent | | | -2.287** |
| Constant | -0.141** | -0.122** | -0.184** |
| R-Square | 0.444 | 0.424 | 0.297 |

Farmland Value Expectation +1% →
Farmland Value +0.84% 6 months later
Sale Activities +1.70% 6 months later

Conclusion and Policy Implication

- By using the unique and rarely-used data on farmland value expectation, we provide support for the hypotheses that farmland value expectation has a positive impact on future farmland value and farmland sale activity
- Our results suggest that expectations on farmland value can amplify fluctuations and risk in farmland market.
 - ✓ Expectation overreact to external changes → actual farmland value in the future fluctuate more greatly → bubbles and troughs.
 - ✓ High expectation → premature land purchases → over leveraging and loss of liquidity → risk in farmland market increased

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