

# Expectations and Expert Opinion Surveys: Empirical Tests Using a Panel of Iowa Land Value Survey Responses

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# Motivation

- Tegene and Kuchler (1991) reject rational expectations hypothesis for farm real estate and argue in favor of adaptive expectation hypothesis
  - Farm real estate values determined by previous expectations and observations, not full set of current information
  - Implies prices slow to change to new information
- Surveys of expectations (“direct” elicitation) provide “model-free” test of expectations structure (Pesaran, 1987)

# Objective

- Goal: Examine how individual survey respondents formulate current land value expectations and what information they rely on
- Data: a 11-year panel of individual Iowa agricultural professionals' estimates of current land value – Iowa Land Value Survey 2005-2015

# Challenges of estimating expectations models

- “True” value is unknown
- Respondent information set difficult to observe
- Respondent’s estimate of current value is expectation of horizon zero

# Iowa Land Value Survey panel sample: 466

## Farmland Values in Your County as of November 1, 2014\*

1. Values for average-size farms in **«CoName»** County are:

|                   | <u>Your Reported Values Last Year</u> | <u>Present Estimates</u> |
|-------------------|---------------------------------------|--------------------------|
| High grade land   | \$ <u>«High Value»</u> /acre          | \$ _____/acre            |
| Medium grade land | \$ <u>«Medium Value»</u> /acre        | \$ _____/acre            |
| Low grade land    | \$ <u>«Low Value»</u> /acre           | \$ _____/acre            |

- Annual survey of farm real estate market professionals (e.g., farm managers, appraisers, real estate brokers, assessors, etc.)
- Last year's individual estimates supplied
- Final result only contains one average county estimate

# ISU Land Value Survey

- Factors Affecting Land Value
- Information Set

3. *What were the most important factors operating in the land market in your territory since November 2013?*

D Positive

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

Negative

- a. \_\_\_\_\_
- b. \_\_\_\_\_
- c. \_\_\_\_\_

- Respondents also report “most important factors operating in the land market” in current year
- Positive and negative factor
- Common responses include:  
Interest rates, Yields, Land availability, Commodity prices

# Empirical strategy

- Examine the influence of prior “error” (deviation between individual and county aggregate)
- Simple model based on important factors, similar to net present value of farmland
  - Income (proxied by commodity prices)
  - Interest rates
  - Sale activity
- Panel Data Individual Fixed Effects Model

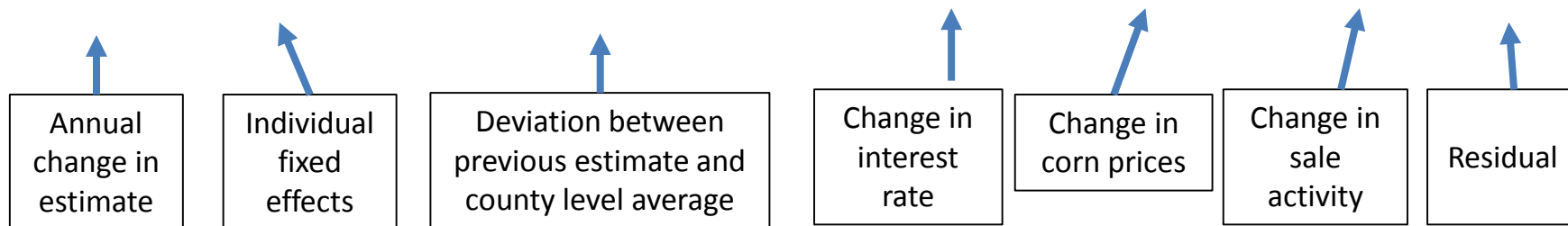
# Empirical model

- Define annual change at time  $t$  for respondent  $i$  in county  $j$  as:

$$\Delta y_{i,j,t}^* = y_{i,j,t}^* - y_{i,j,t-1}^*$$

- The model takes the form:

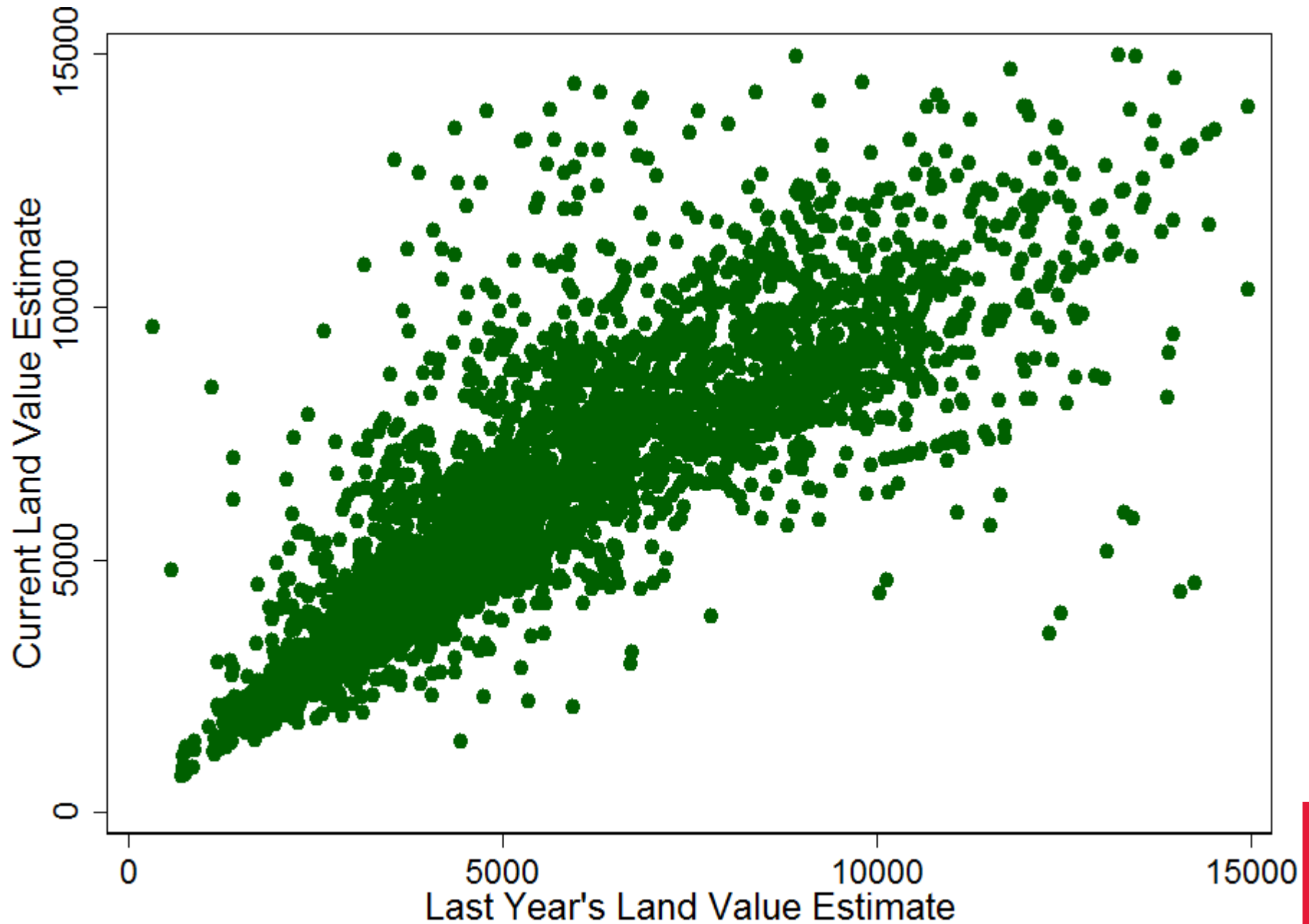
$$\Delta y_{i,j,t}^* = \alpha_i + \gamma(y_{i,j,t-1}^* - \bar{y}_{j,t-1}) + \beta_1 \Delta r_t + \beta_2 \Delta p_t + \beta_3 \Delta v_t + \varepsilon_{i,t}$$



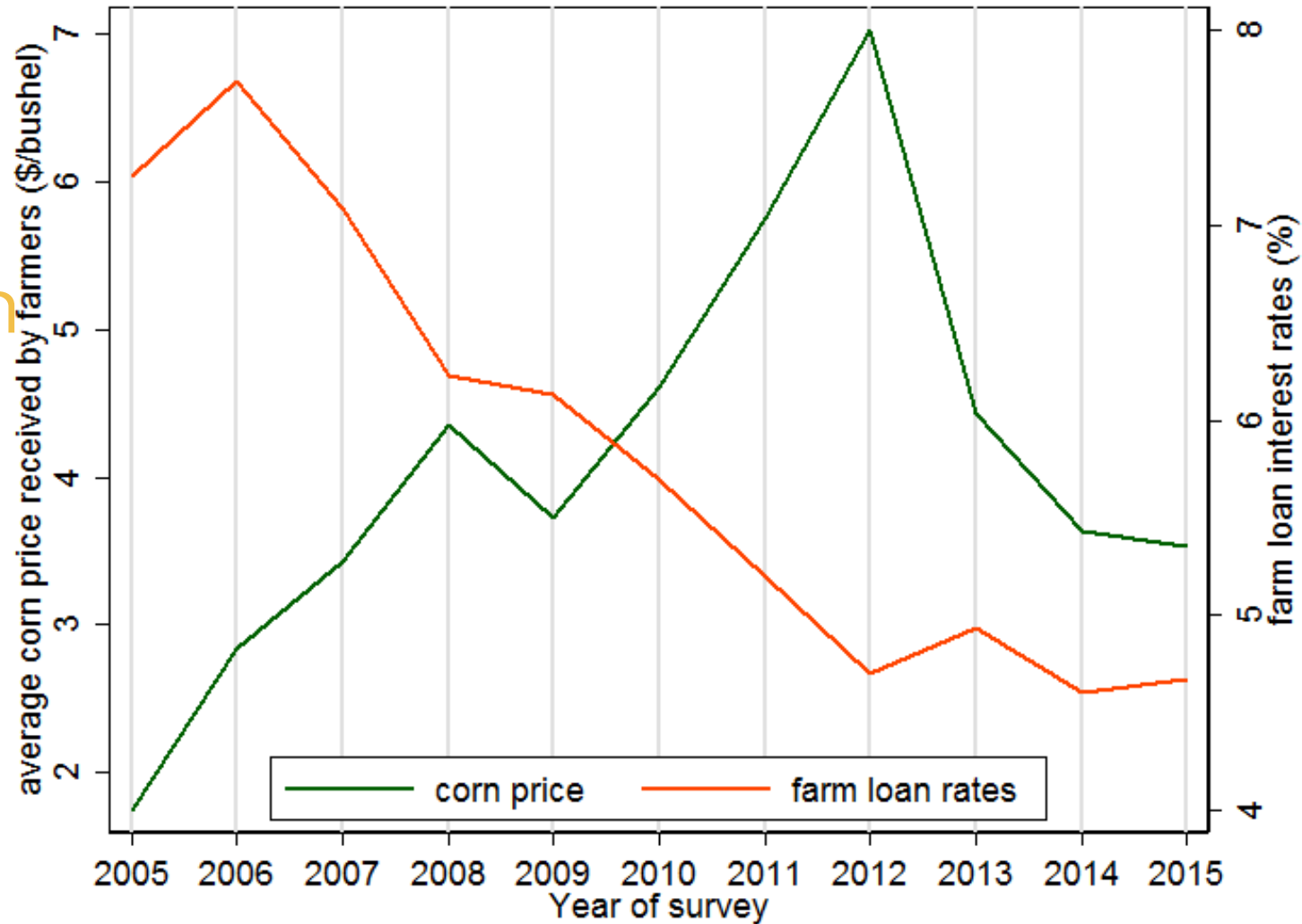
- All variables expressed in natural logs
- $\bar{y}_{j,t-1}$  county-level average value adjusted by Ag Census
- Farm Real Estate interest rate obtained from Chicago Fed



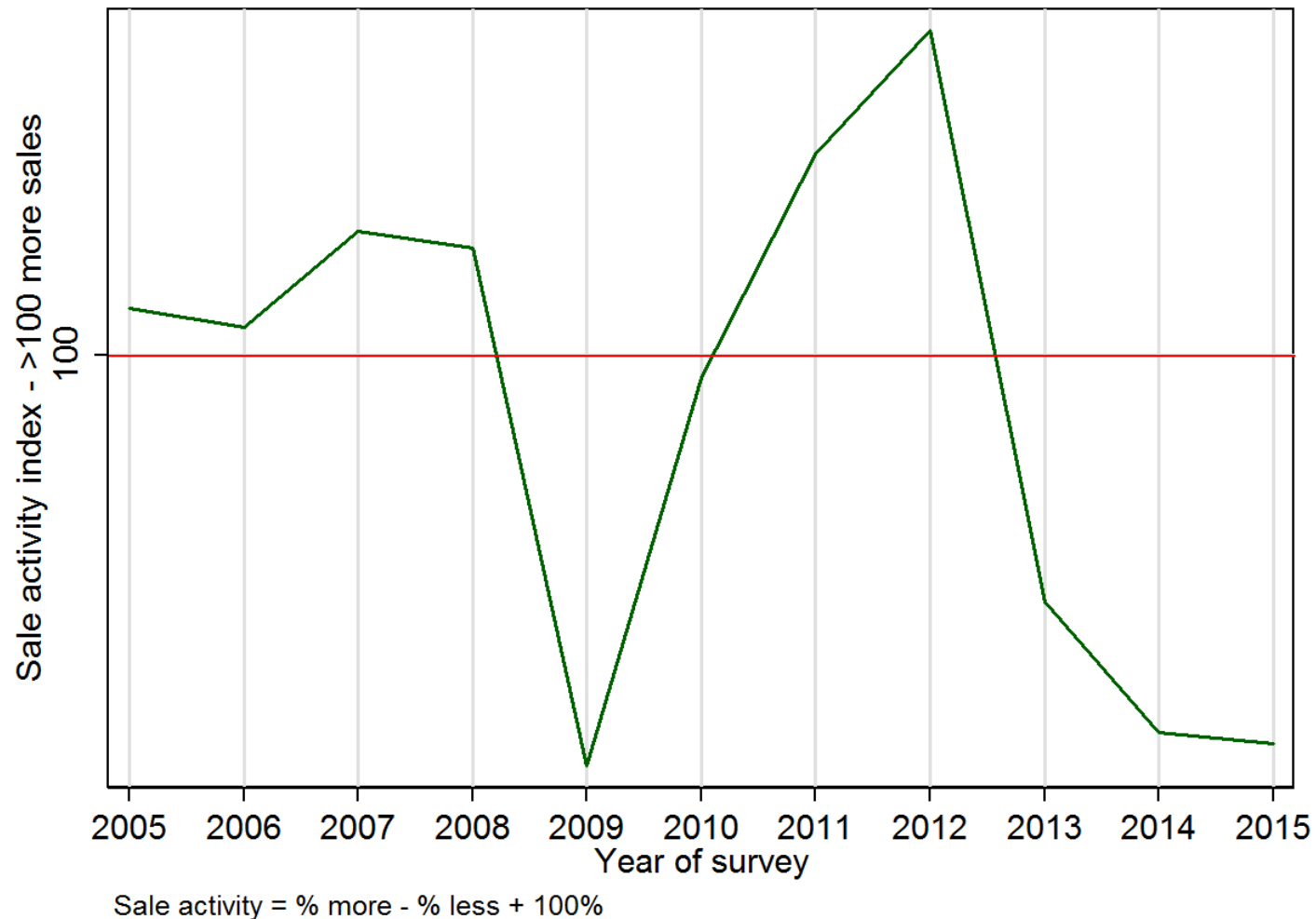
# Current Estimate vs. Last Year's Estimate



# Info: corn price interest rate



# Info: sale activity index



- Sale activity = percent reported more sales – percent reported less sales + 100

# Results (average)

## Individual fixed effects model

| Variable   | Simple        |            | Full          |            |
|--|---------------|------------|---------------|------------|
| Prior deviation<br>( $y_{i,j,t-1}^* - \bar{y}_{j,t-1}$ ) | <b>-0.860</b> | <b>***</b> | <b>-0.844</b> | <b>***</b> |
|  | (0.058)       |            | (0.055)       |            |
| Farm loan rate<br>$\Delta r_t$                           |               |            | <b>-0.551</b> | <b>***</b> |
|  |               |            | (0.044)       |            |
| Corn price<br>$\Delta p_t$                               |               |            | <b>0.169</b>  | <b>***</b> |
|  |               |            | (0.017)       |            |
| Sale activity<br>$\Delta v_t$                            |               |            | <b>0.031</b>  | <b>***</b> |
|  |               |            | (0.009)       |            |
| $R^2$  | 0.334         |            | 0.446         |            |

# Results (by class)

| Variable                            | Low           |     | Medium        |     | High          |     |
|-------------------------------------|---------------|-----|---------------|-----|---------------|-----|
| $(y_{i,j,t-1}^* - \bar{y}_{j,t-1})$ | <b>-0.882</b> | *** | <b>-0.858</b> | *** | <b>-0.837</b> | *** |
|                                     | (0.072)       |     | (0.064)       |     | (0.058)       |     |
| $\Delta r_t$                        | <b>-0.453</b> | *** | <b>-0.525</b> | *** | <b>-0.606</b> | *** |
|                                     | (0.072)       |     | (0.061)       |     | (0.051)       |     |
| $\Delta p_t$                        | <b>0.175</b>  | *** | <b>0.164</b>  | *** | <b>0.171</b>  | *** |
|                                     | (0.024)       |     | (0.019)       |     | (0.020)       |     |
| $\Delta v_t$                        | <b>0.027</b>  | *   | <b>0.036</b>  | *** | <b>0.024</b>  | *   |
|                                     | (0.014)       |     | (0.011)       |     | (0.010)       |     |
|                                     |               |     |               |     |               |     |
| $R^2$                               | 0.351         |     | 0.364         |     | 0.374         |     |

# Explaining changes in land value estimates over time

- Respondents influenced by prior deviations: 1% increase in the deviation from the county average from last year → 0.84% decrease in this year's response
- Respondents more responsive in % terms to interest rate changes than commodity price shifts and sale activity changes
- Some heterogeneity in responses across the land quality classes

# Future plans

- Alternative regressors
  - **Income**: five-year average net corn revenue
  - **Sale activity**: FCS actual sale volume data by crop reporting district
  - **True value**: average arm's-length sale prices by county for selected counties
- Related work on expectation formation
  - Adaptive vs. rational vs. extrapolative

# Iowa Farmland Value Portal

<http://card.iastate.edu/farmland>



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## Iowa Farmland Value Portal <sup>BETA</sup>

Your One-Stop Web-Portal for Everything You Need to Know about Iowa's Farmland Value

[2015 Results](#) [Charts](#) [Interactive County Maps](#) [Downloads](#) [Resources](#) [Archive](#)

Select a county or district:

Select result format:  dollar value  annual percentage change  farmland value indexes (state only)

Select data sources:  ISU Iowa Land Value Survey  USDA National Agricultural Statistics Service  
 REALTORS Land Institute  Federal Reserve Bank of Chicago

Years:  through

Show Values

Show Iowa Average  Show District Average

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# Thank You!

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