Selected Poster:

Factors Determining Long-Term Trend of Agricultural Land Values in South Dakota

Authors and Contact Information:

Dr. Larry Janssen, Professor of Economics
E-mail: larry.janssen@sdstate.edu

Ms. Kopila Bhattarai, Graduate Assistant
E-mail: Kopila.bhattarai@sdstate.edu

Dr. Kuo-Liang Chang, Assistant Professor of Economics
E-mail: kuo-liang.chang@sdstate.edu

Department of Economics
South Dakota State University
Brookings, SD 57007
Phone: 605-688-4141

Selected Poster prepared for presentation at the Agricultural and Applied Economics Association's 2013 AAEA & CAES Joint Annual Meeting, Washington DC, August 4 – 6, 2013

Factors Determining Long-Term Trend of Agricultural Land Values in South Dakota

Dr. Larry Janssen, Kopila Bhattarai, and Dr. Kuo-Liang Chang

Department of Economics, South Dakota State University, Brookings, SD - 57007

Introduction

Agricultural lands in the northern Great Plains have experienced significant increase in cash value in recent years. For example, during the past four years of general U.S. economic recession and slow recovery, South Dakota farmland values increased at an annual statewide average rate of 13.7%. Over a longer 22-year period (1990 – 2012), farmland values increased at an annual average rate of 10.3%.

In this project, we seek to:

i. Identify major determinants of farm real estate values and estimate their relative influence

ii. Identify and highlight the geo-spatial correlations that affect the diverse patterns of land values across South Dakota

Materials and methods

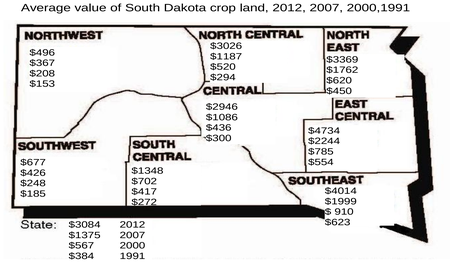
This study uses data from the annual SDSU South Dakota Farm Real Estate Survey from 1991 through 2012. The data includes information regarding per acre land values and cash-rental rates, and gross cash-rent-to-land value ratio for non-irrigated cropland, hay land, pasture, and rangeland. The survey data also contains average per acre values and cash rental rates of high-productivity and low productivity-levels for each land use. For econometric analyses, we construct a panel dataset from the 5200 observations in the complete dataset. County level data for per-acre cropland values and value of farm product sales are used for geo-spatial correlation analyses using SAS for Mixed Models (Littell et al., 2010).

Key Findings for South Dakota:

- Average cash rental rates increased for all agricultural land uses in all regions, but generally at a slower rate than per acre land values.
- The rent-to value ratio was stable in the 1990's (7to 8%) and sharply declined from 2001 to 2012 (3.5 to 4%). The trend in rent-to-value ratios and long-term interest rates over time are similar.
- Regional variation in land values is mainly due to differences in productivity as reflected in cash rental rate differences.
- Technology (GMO's, no-till) led to regional changes in crop intensity and differential increases in cash rents and land values.

Trends in agricultural land values in South Dakota

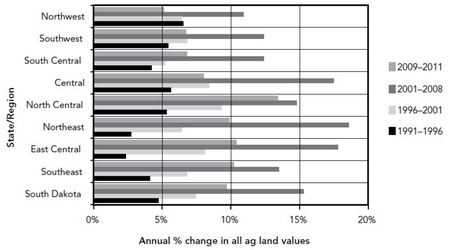
Average value of South Dakota crop land, 2012, 2007, 2000,1991



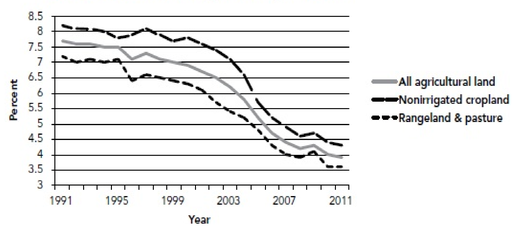
Regional and statewide average values of cropland are the weighted averages of dollar value per acre of non-irrigated cropland by region for 2012, 2007, 2000, and 1991 (top to bottom

Source: 2012 South Dakota Farm Real Estate Market Survey, SDSU.

Annual percentage change in all ag land values in four time periods, 1991–2011



Gross rent-to-value ratio by land use, 1991–2011



Key Findings – continued:

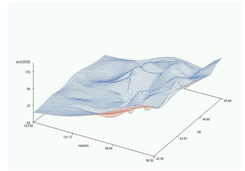
- Four major periods of land value changes in SD:
  - 1991-1996 recovery from farm crisis of 1980's
  - 1996-2001 impacts of federal farm programs & crop technology changes
  - 2001-2008 sharp decline in interest rates, rapid increase in ethanol production
  - 2008 – 2012 national recession, agricultural product price boom

Econometric modeling is in process to estimate the relative influence of specific factors.

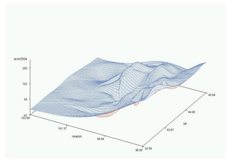
Values Changes (2000-2010)

Agricultural sales per acres

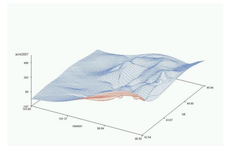
2000



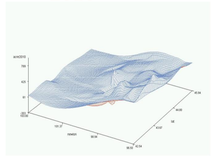
2004



2007

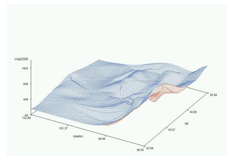


2010

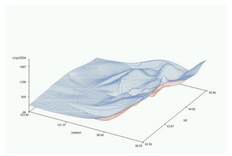


Cropland value per acre (2000-2008)

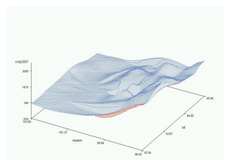
2000



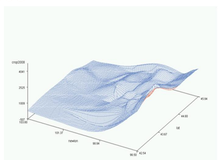
2004



2007



2008



- The east site of the state consistently obtained higher agricultural revenue per acre and cropland value per acre.
- The east side of the state also experienced faster growth in both agricultural revenue per acre and cropland values per acre.
- The resulting p-values (<0.0001) of the reported Moran's I suggest we can reject the null hypothesis that there are zero spatial autocorrelation in revenue and cropland value per acre.

Future Directions

With a combination of geo-spatial statistics and econometric methods applied to the available rich dataset, this study aims to generate useful information regarding the trend of cash value and rental rate in agricultural lands in South Dakota and some underlying factors explaining these trends.

Through this research, we expect to identify major determinants of farm real estate values and changes in values as well as identify and highlight the geo-spatial correlations that affect the diverse patterns of land values across South Dakota.

Conclusions

We expect scholars and stakeholders interested in the current land value issues will find our results insightful and interesting. The information presented in the meeting can also be very useful for decision-makers, farm operators, and other stakeholders in land management and agricultural production in the Northern Great Plains.

Literature cited

Janssen, Larry and Burton Pflueger.2012.South Dakota Agricultural Land Market Trends. SDSU AES Report 03-3007-2012.

Littell, Ramon, Milliken, George, Stroup Walter, Wolfinger, Russell, Schabenberger, Oliver. 2010. SAS for Mixed Models, 5th Print, SAS Institute Inc, Cary, North Carolina.

Acknowledgments

Funding for this research is from project H-440-12 from the SDSU Agricultural Experiment Station and from SDSU Foundation Farm Credit Services Excellence Fund 3X0684

For further information, contact:

Dr. Larry. Janssen (Professor) Corresponding Author
E-mail: larry.janssen@sdstate.edu
Dr. Kuo-Liang Chang (Assistant Professor)
Kopila Bhattarai (Graduate Assistant – Economics)