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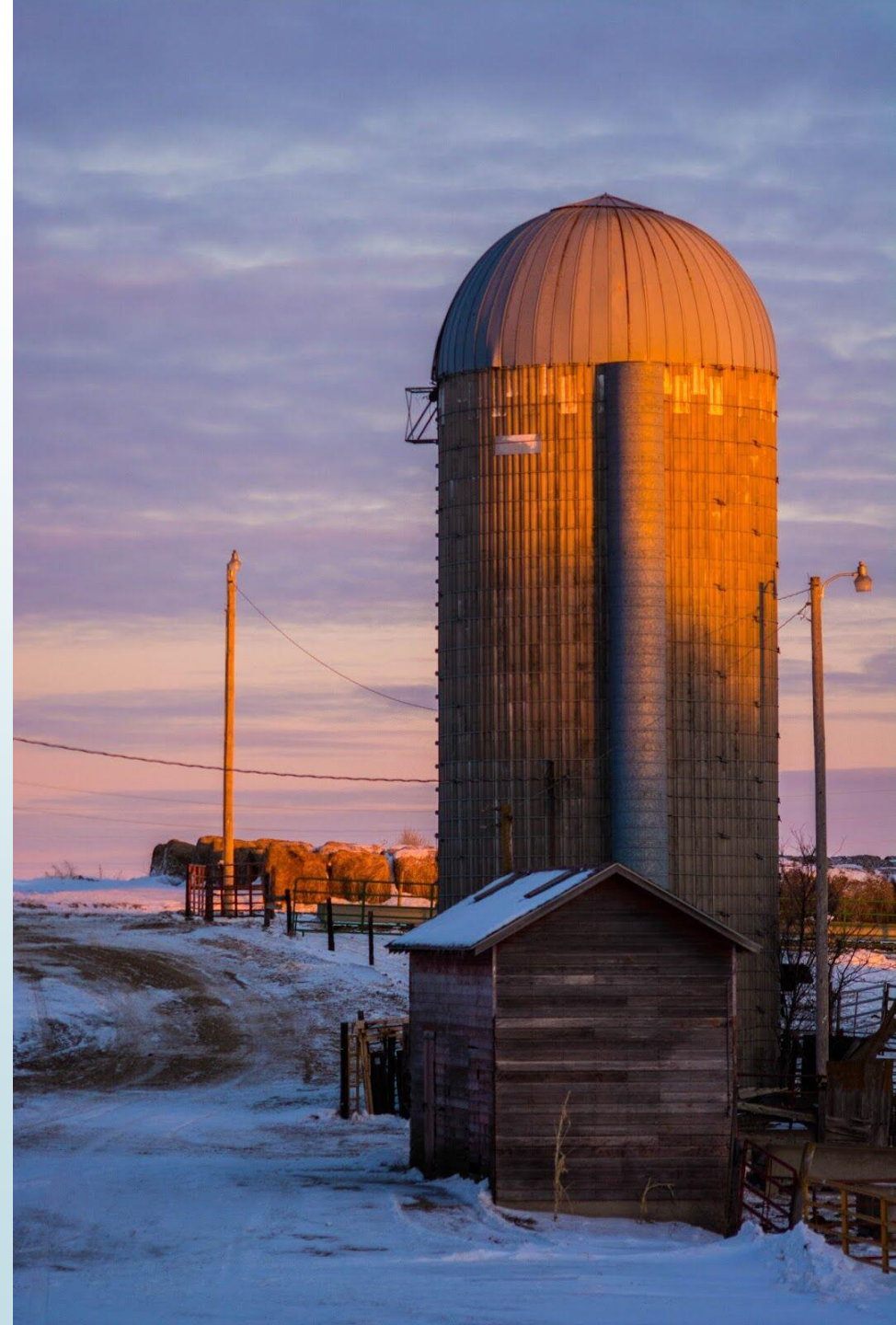
Differences in Land Values During Periods of Rapid Change

By Lucas Sudbeck, Mykel Taylor, Allen Featherstone, and Christine Wilson

Kansas State University

NC-1177 Conference

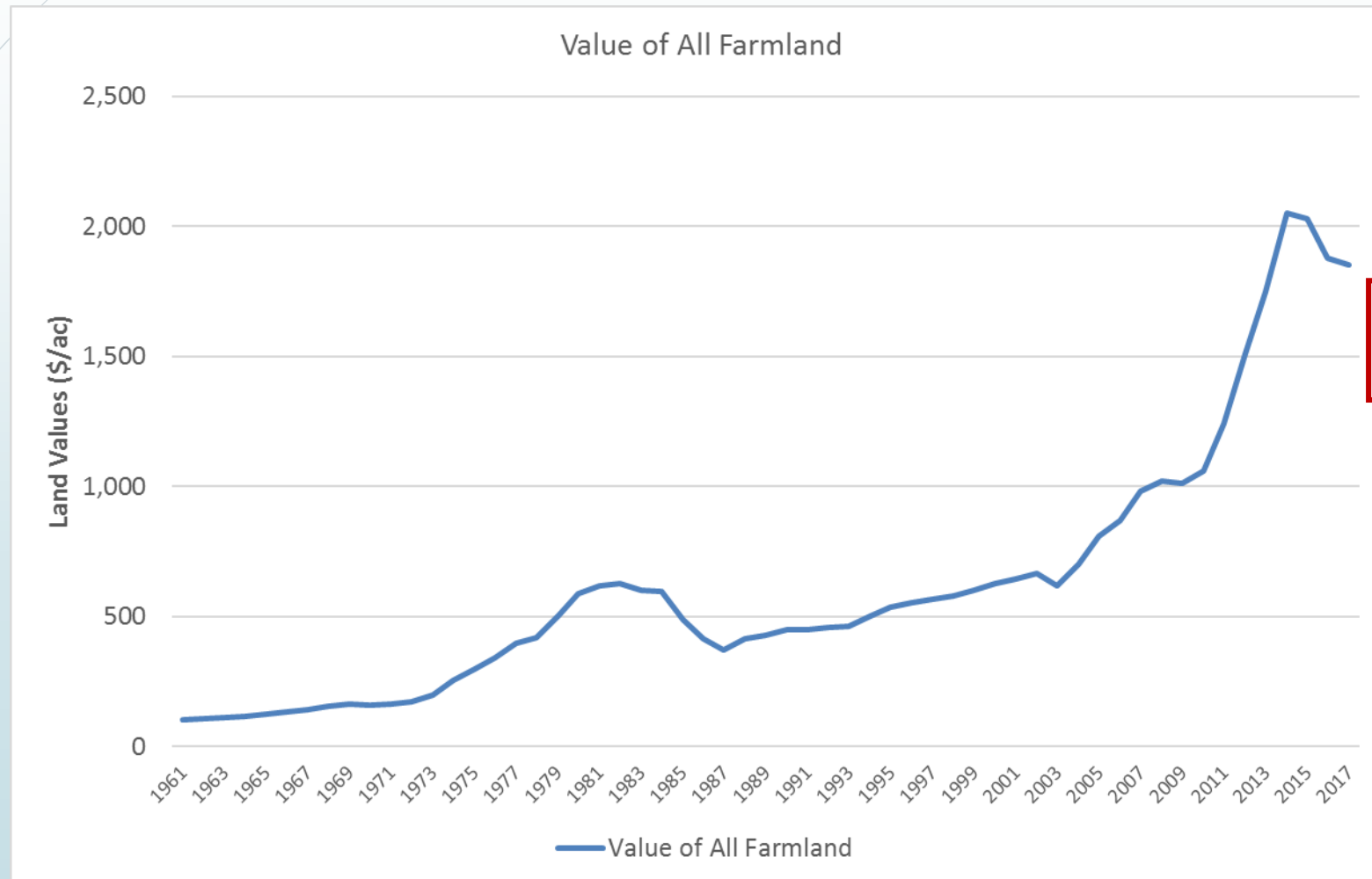
October 2, 2017





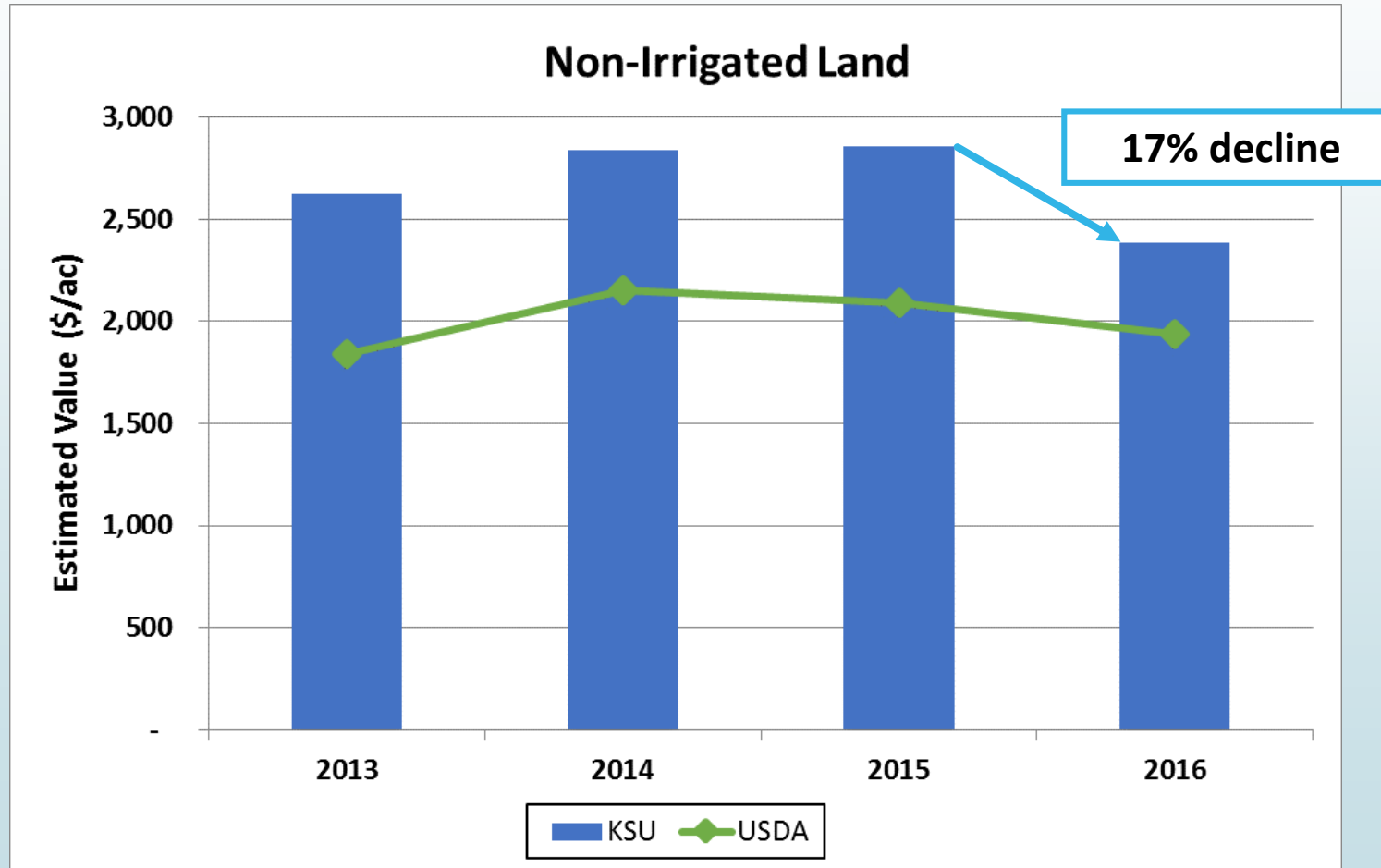
Land Value Trends

Kansas Land Values - USDA

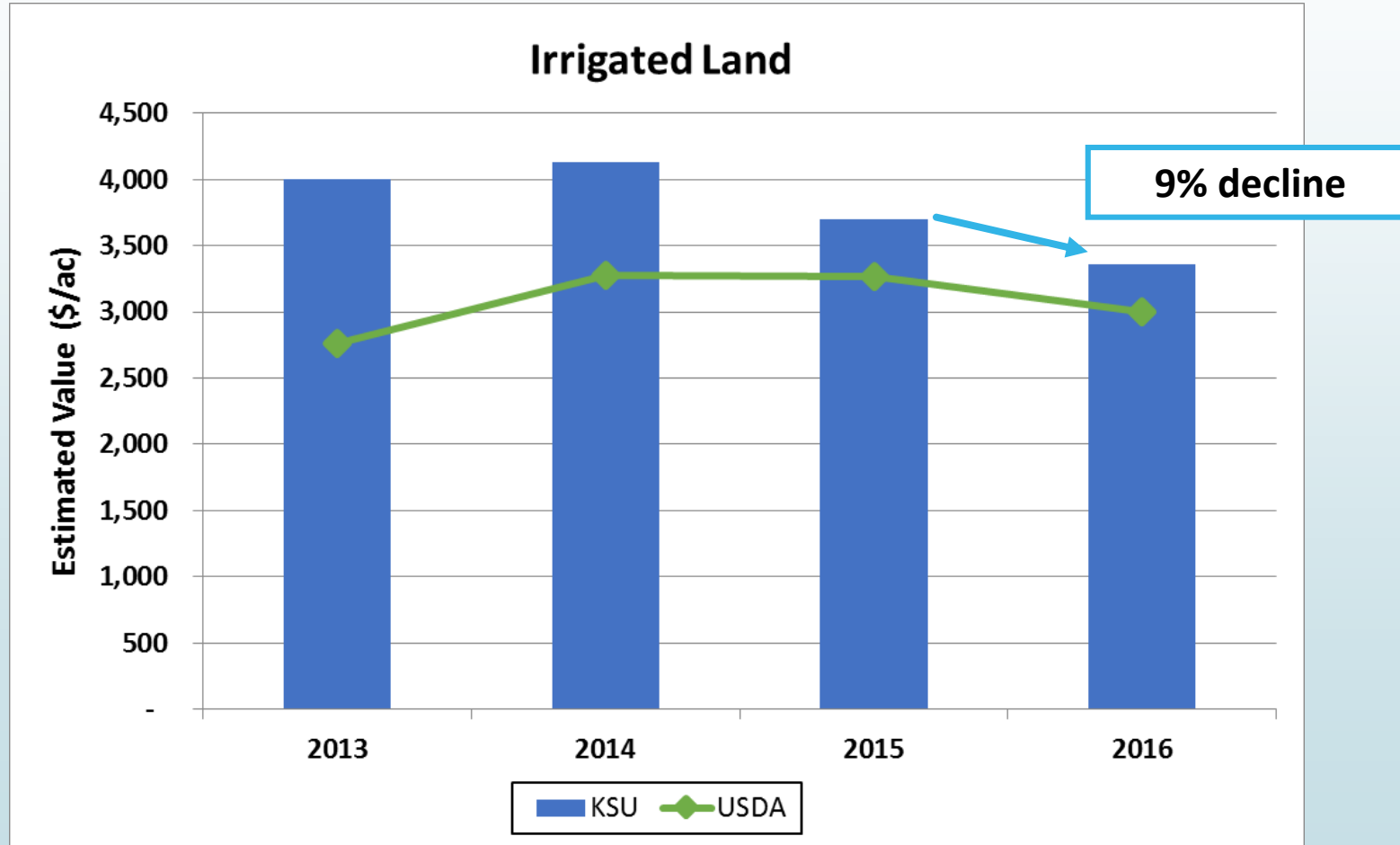


**9.8%
decline**

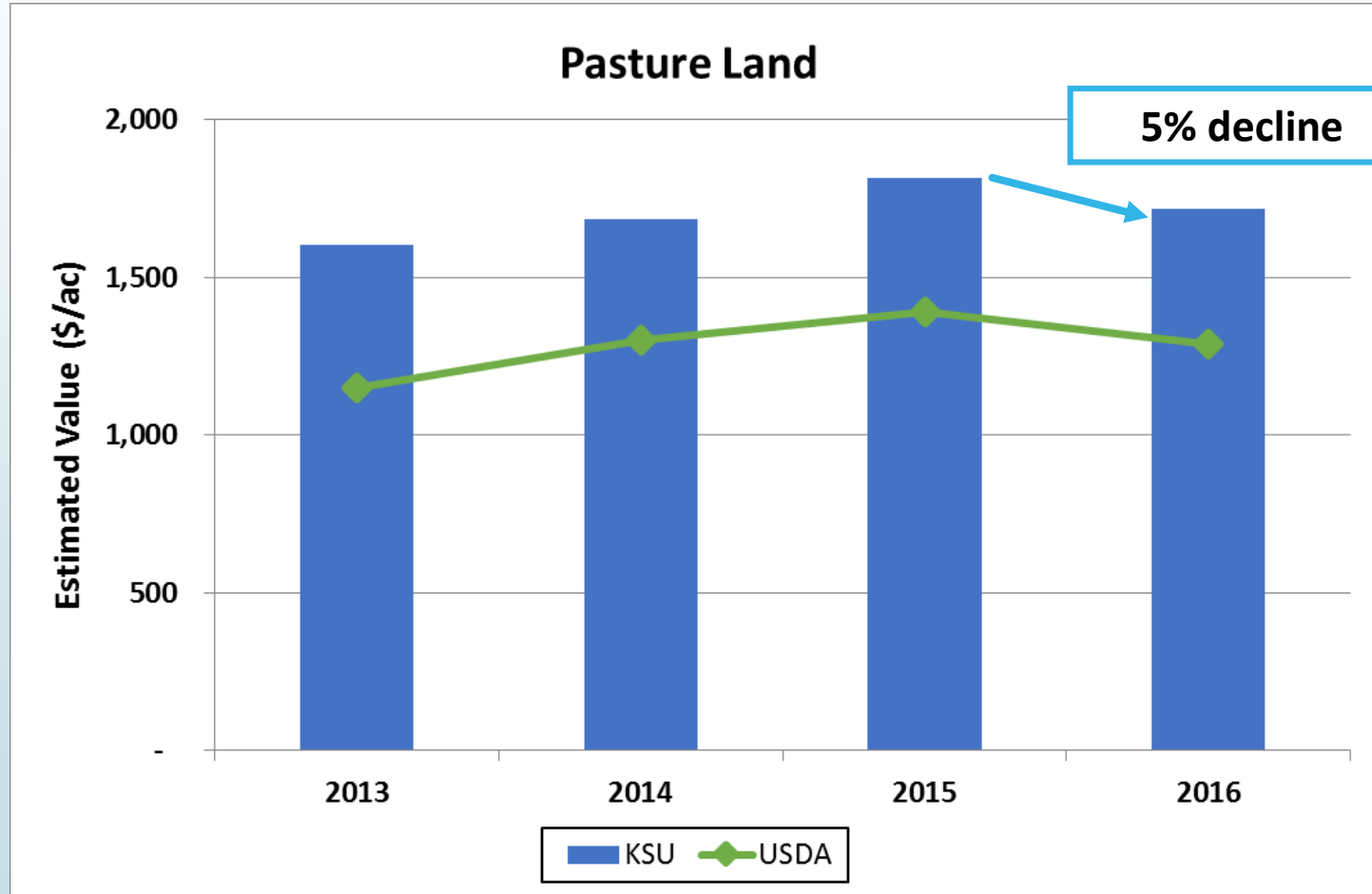
Kansas Land Values – Sales Data



Kansas Land Values – Sales Data

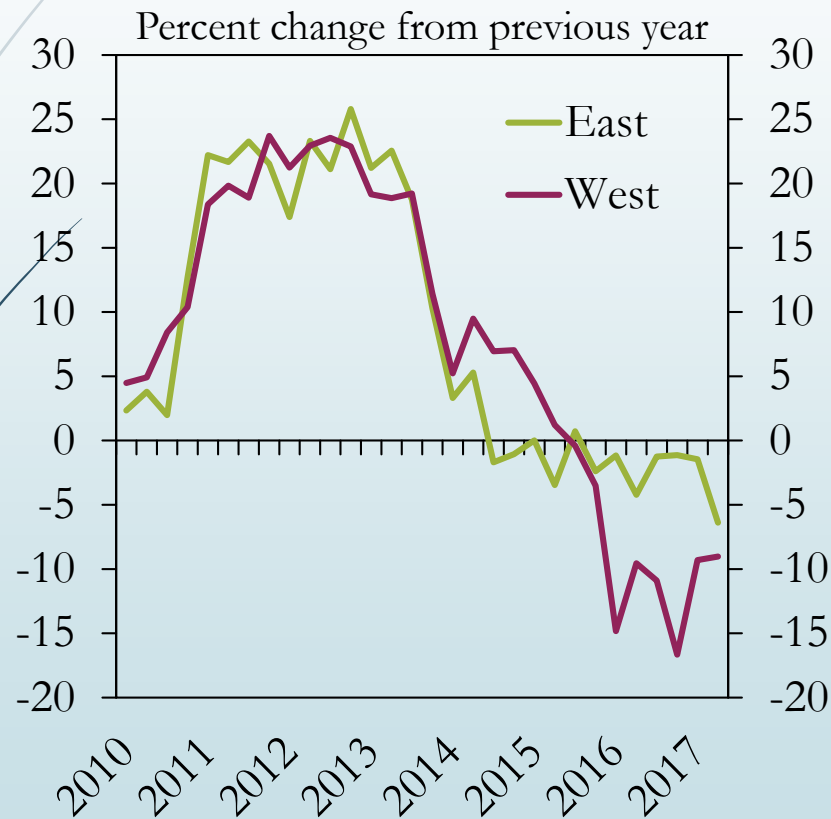


Kansas Land Values – Sales Data



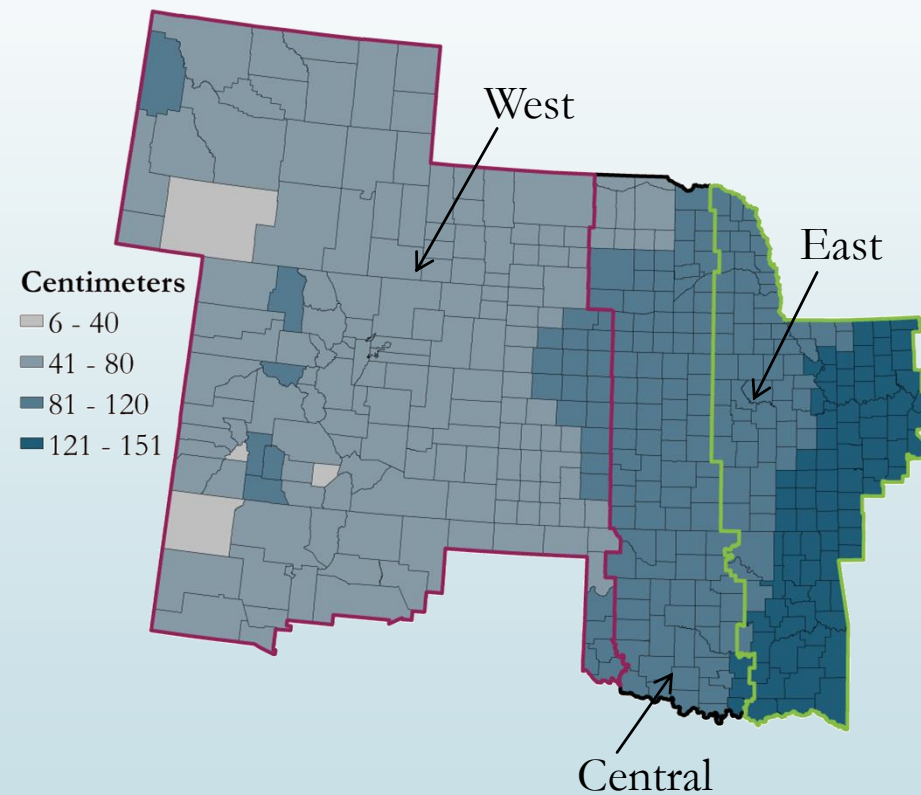
Variability in Land Values

Tenth District Nonirrigated Farmland



Land Quality

Soil Available Water Storage + Precipitation*



*Research has shown that root-zone available water storage (AWS) is an important soil property and a good indicator of soil quality. According to Cowley (2016), area-weighted average AWS and precipitation have significant and positive relationships with farmland values in the Tenth District. Sources: Federal Reserve Bank of Kansas City, USDA, NWS, and Cowley, C. 2016. "The Dispersion of Farmland Values in the Tenth District." Federal Reserve Bank of Kansas City, *Economic Review*, vol. 101, no. 4, pp. 29-67.



Market Conditions

► “Land prices are still based on quality land having the highest demand and poor land having few buyers and lower prices.”

► Appraiser in Central Kansas,
September 2017

A dark blue arrow points to the right at the top left. Below it, several thin, curved lines in shades of blue and grey sweep across the left side of the slide.

Motivation for Research

- Comments in the state regarding low quality land losing its value first, while the high quality land maintains its value
- Can we see a difference in the rate of change of land values during the recent downturn in Kansas?



Literature Review

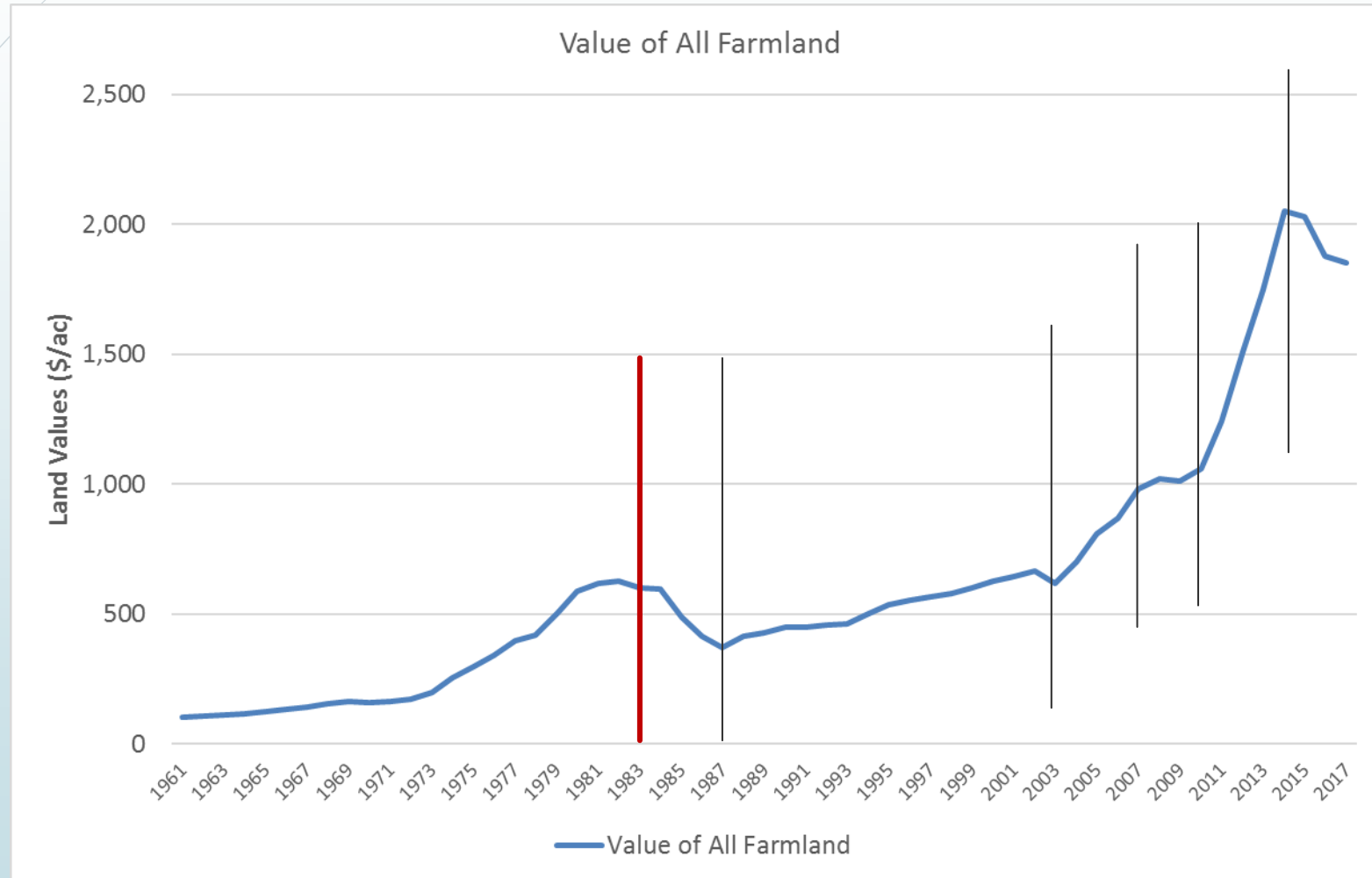
- Schurle, et al (2013)
 - Compared absolute and relative variability in land prices during periods of stable land prices versus rapidly changing land prices
 - While the absolute variability increased, the relative variability is nearly constant across years (1971-2011)
- Can we pick up changes using only the average land values? What about differences in quality and/or price point?



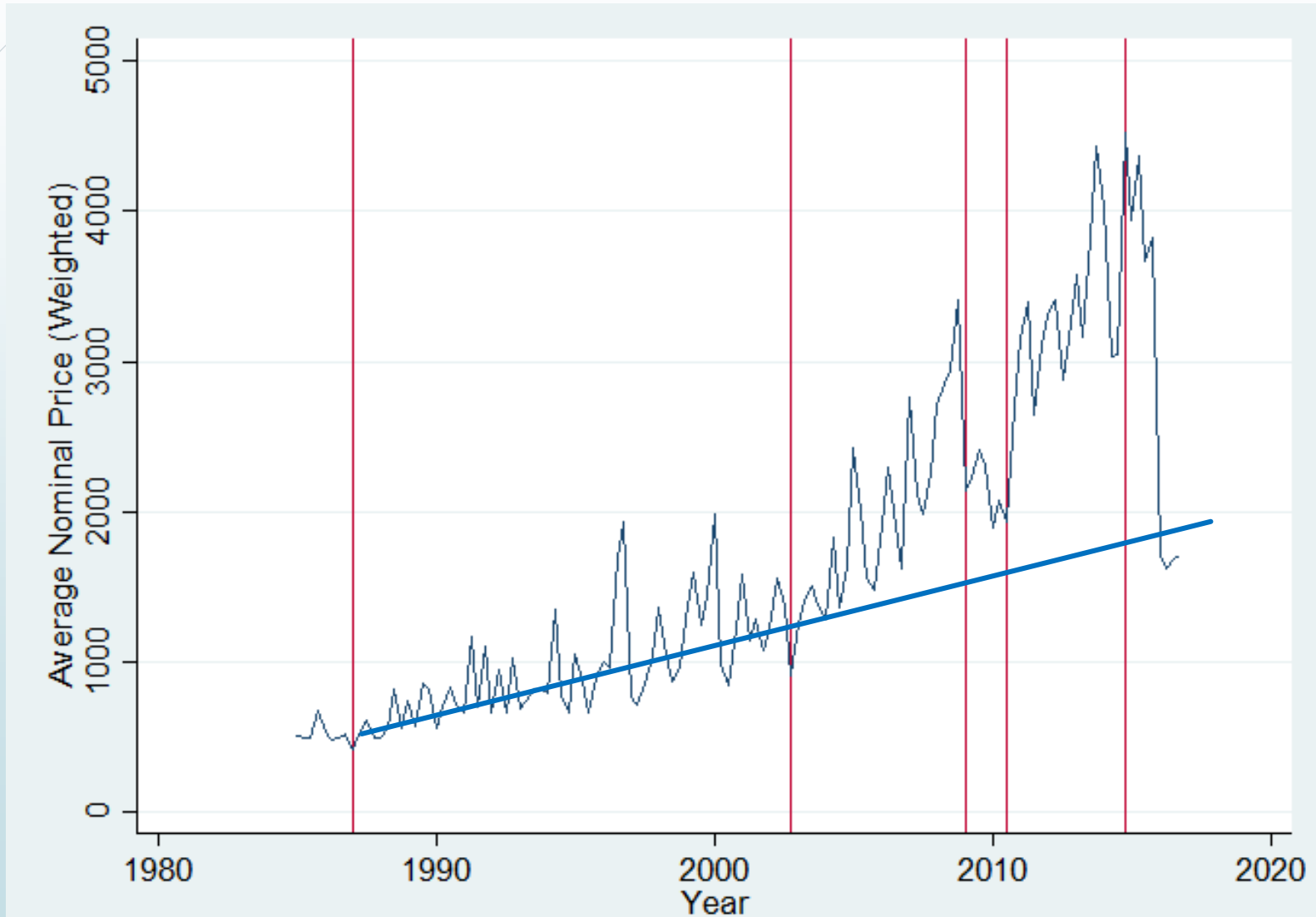
Dataset Construction

- ▶ Land sales in Kansas: 1986 to 2016
 - ▶ Market transactions – arm's length
 - ▶ Bare land values only
- ▶ Aggregation to a quarterly time series
 - ▶ Acre-weighted average by price quartile
 - ▶ Logged the acre-weighted averages to reduce skewness
 - ▶ Calculated the percentage change from same quarter in previous year

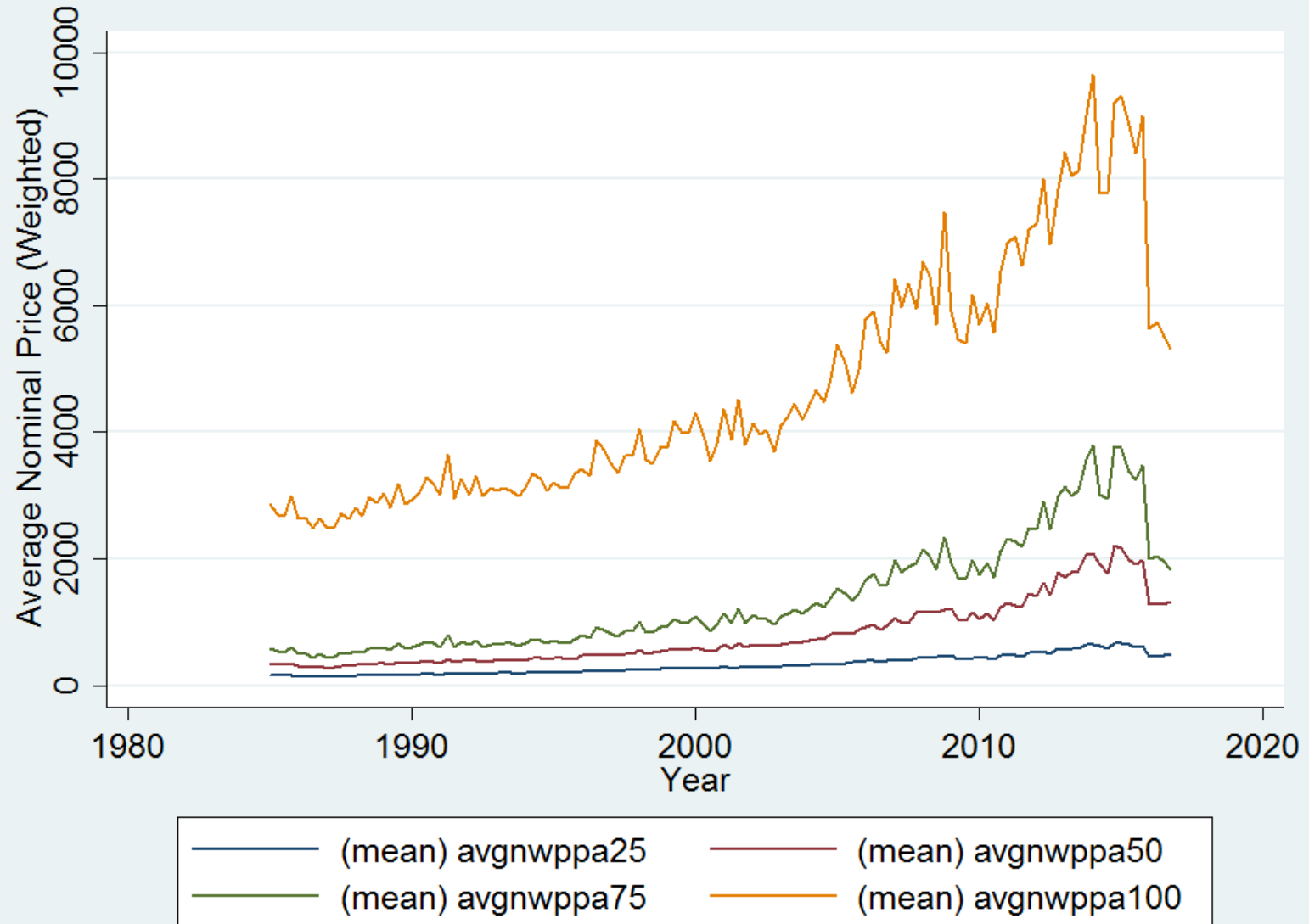
Kansas Land Values - USDA



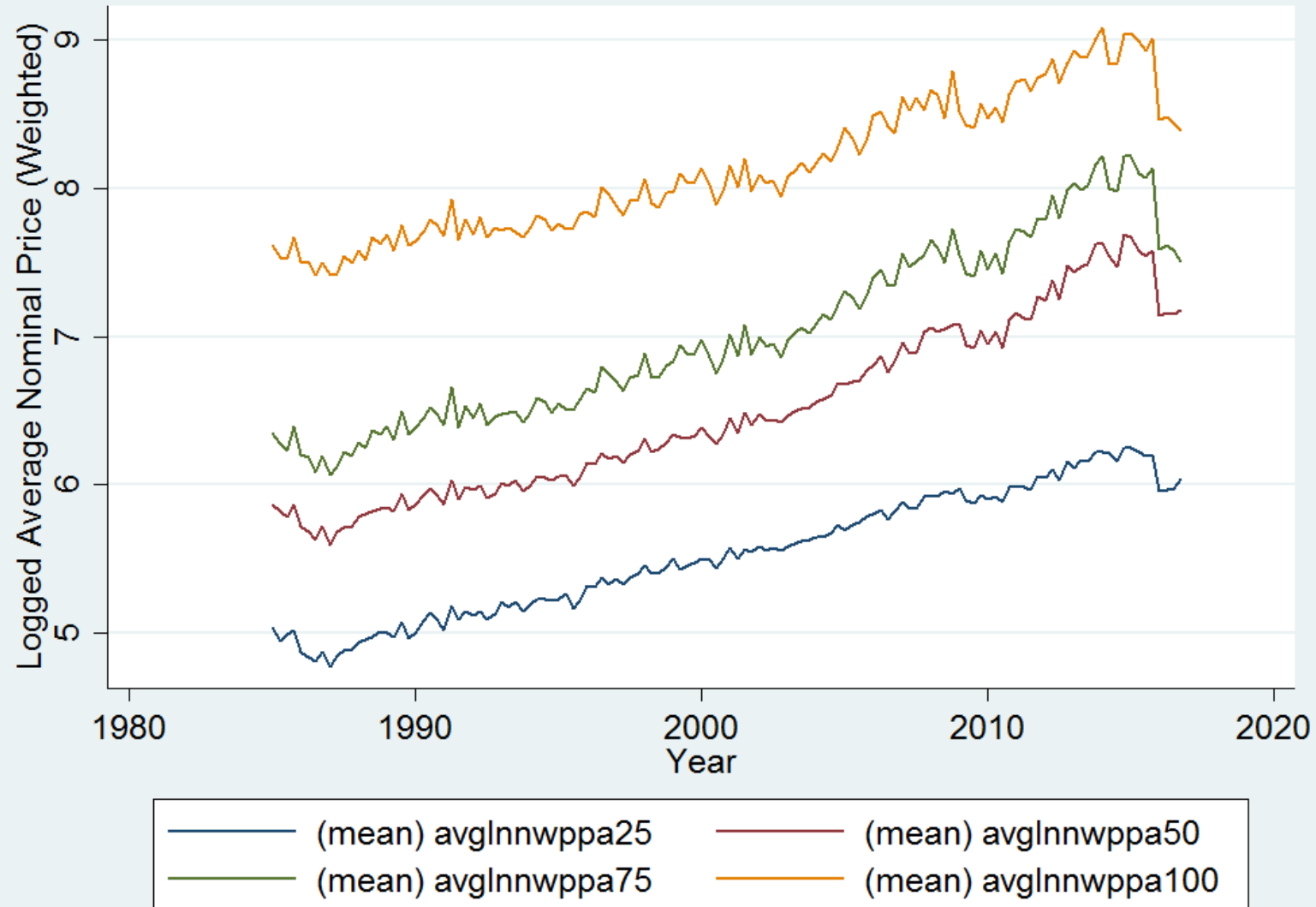
Kansas Land Values – Sales Data



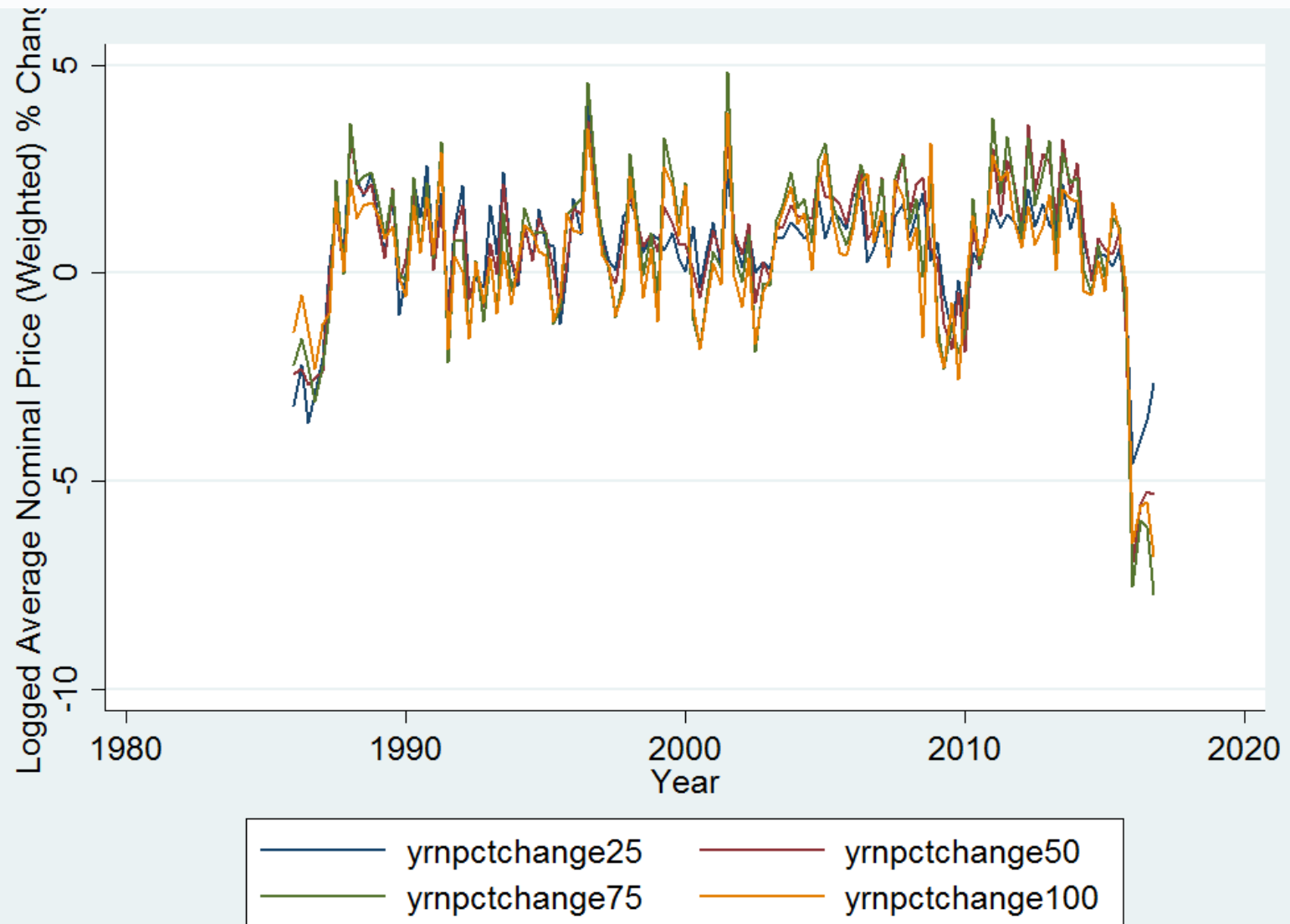
Kansas Land Values by Quartile



Kansas Land Values by Quartile



Kansas Land Values - % Change



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Regression Model

- ▶ Dependent variable
 - ▶ % change from same quarter in previous year
- ▶ Independent variables
 - ▶ Net Farm Income (annual)
 - ▶ DV's for periods of stability, upward, downward trends
 - ▶ Quarter DV's for seasonality

Regression Results

VARIABLES	25 th Quartile	50 th Quartile	75 th Quartile	100 th Quartile
Net Farm Income	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)	-0.0000 (0.0000)
Period 1	-4.1804*** (1.2492)	-3.1446*** (0.6194)	-3.2135*** (0.8785)	-2.2327 (1.9207)
Period 3	0.7558 (0.6322)	0.8440*** (0.3135)	0.8040* (0.4446)	0.8033 (0.9720)
Period 4	-2.7996** (1.1964)	-1.0760* (0.5932)	-1.1863 (0.8414)	-2.3099 (1.8395)
Period 5	2.3837** (1.0457)	1.7410*** (0.5185)	2.0035*** (0.7354)	2.3101 (1.6078)
Period 6	-6.8392*** (1.0025)	-3.3552*** (0.4971)	-4.1902*** (0.7050)	-6.9781*** (1.5413)
Quarter 2	-0.0214 (0.6804)	0.0124 (0.3374)	-0.0069 (0.4785)	0.0462 (1.0461)
Quarter 3	0.1286 (0.6804)	0.0012 (0.3374)	0.0011 (0.4785)	-0.0618 (1.0461)
Quarter 4	-0.1214 (0.6802)	-0.1086 (0.3373)	-0.1974 (0.4784)	-0.4171 (1.0458)
Constant	1.1881 (0.9379)	0.5545 (0.4650)	0.9589 (0.6595)	1.9891 (1.4419)
Observations	124	124	124	124
R-squared	0.4101	0.5078	0.3890	0.2056

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1



Implications and Further Work

- Statistical evidence of differences between land price categories during periods of rapid change
 - Supports KC Fed chart of differences in land quality
- Further work to use a quality measure to separate the values into quartiles
 - Soils data from NRCS, precipitation at the section level
- Confirmation of observations from around the state
 - Implications for asset valuation by lenders

Questions?



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