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Differences in Land Values During Periods of Rapid Change

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

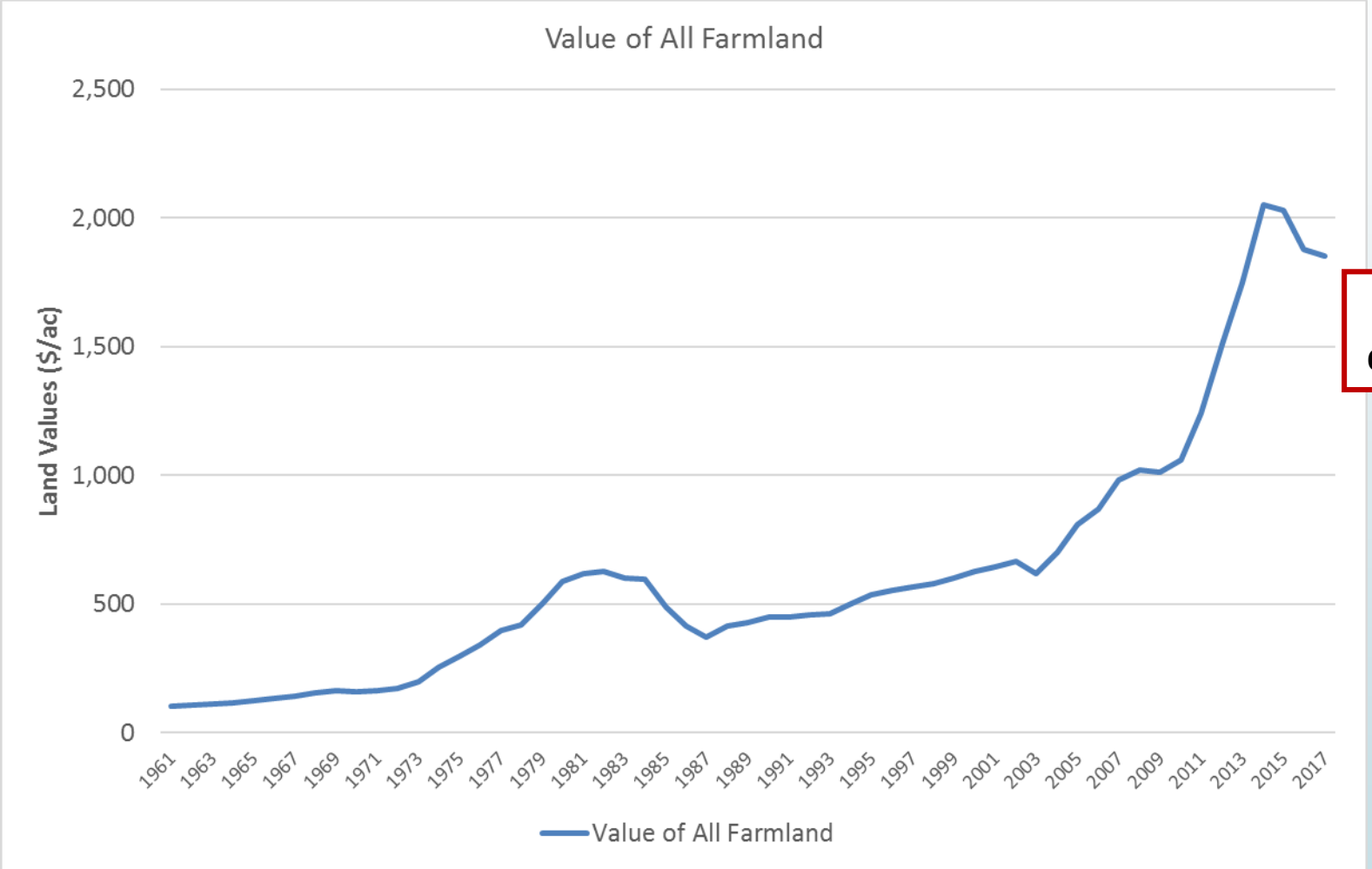
Kansas State University

NC-1177 Conference

October 2, 2017

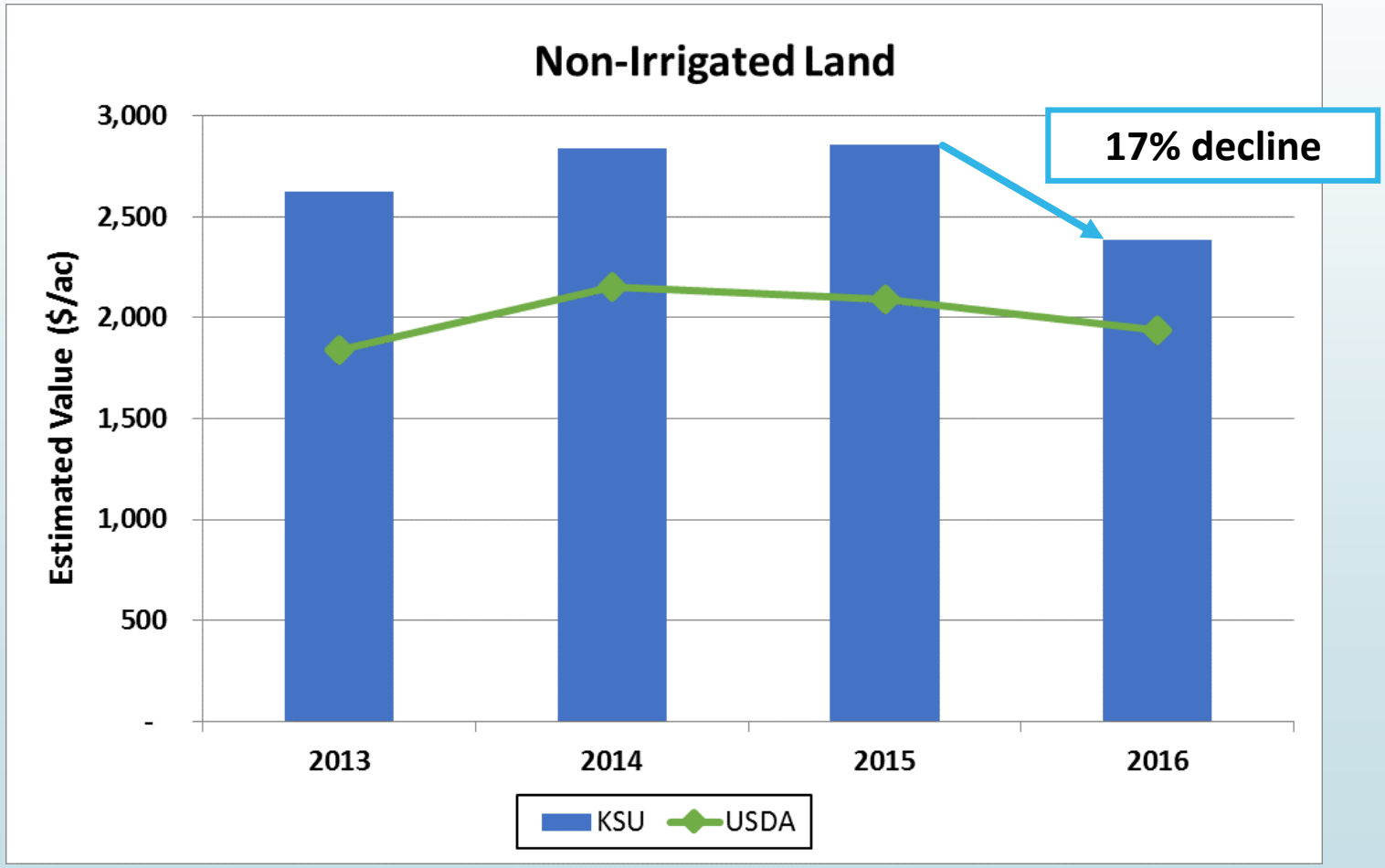
Land Value Trends

Kansas Land Values - USDA



9.8% decline

Kansas Land Values – Sales Data



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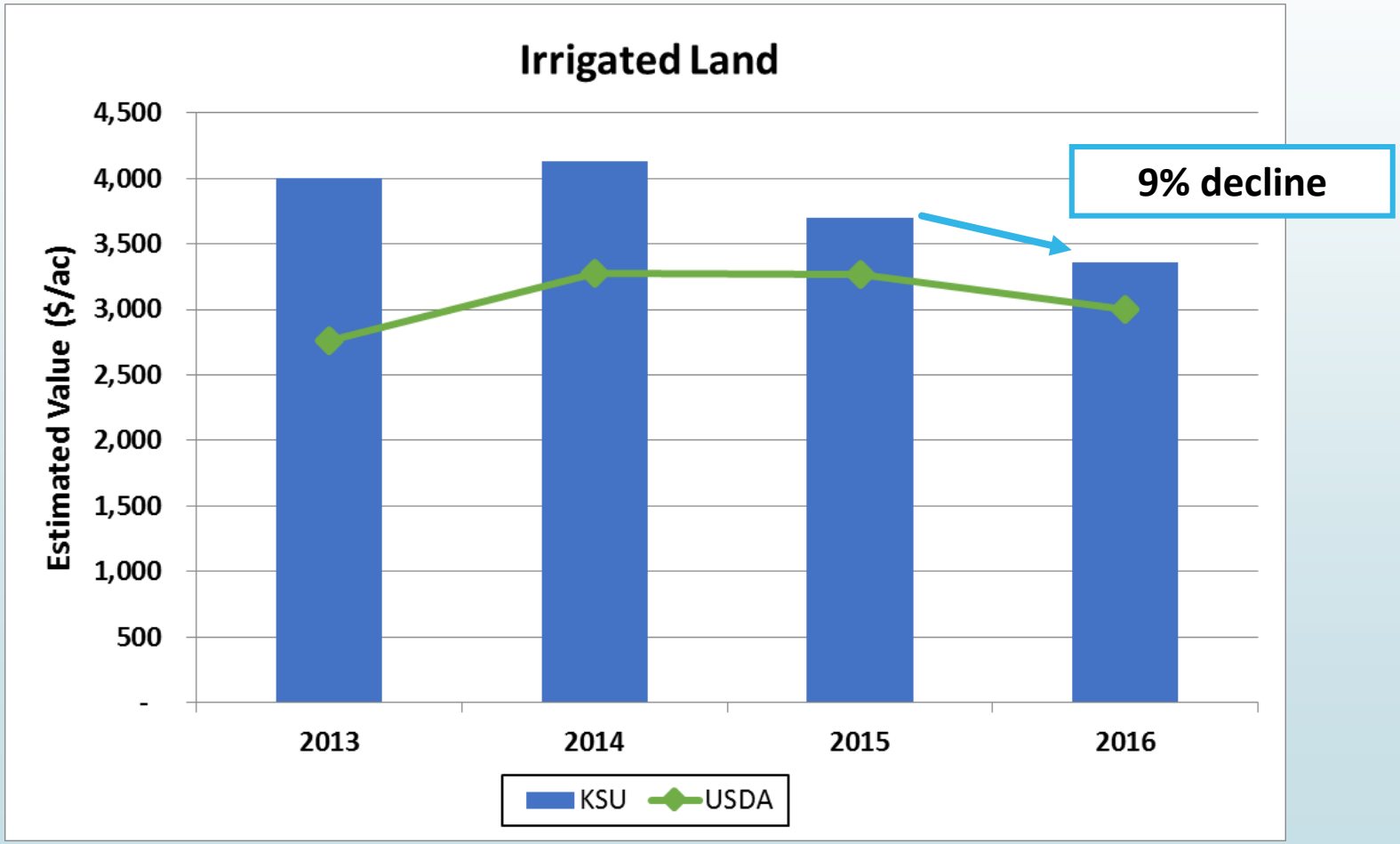

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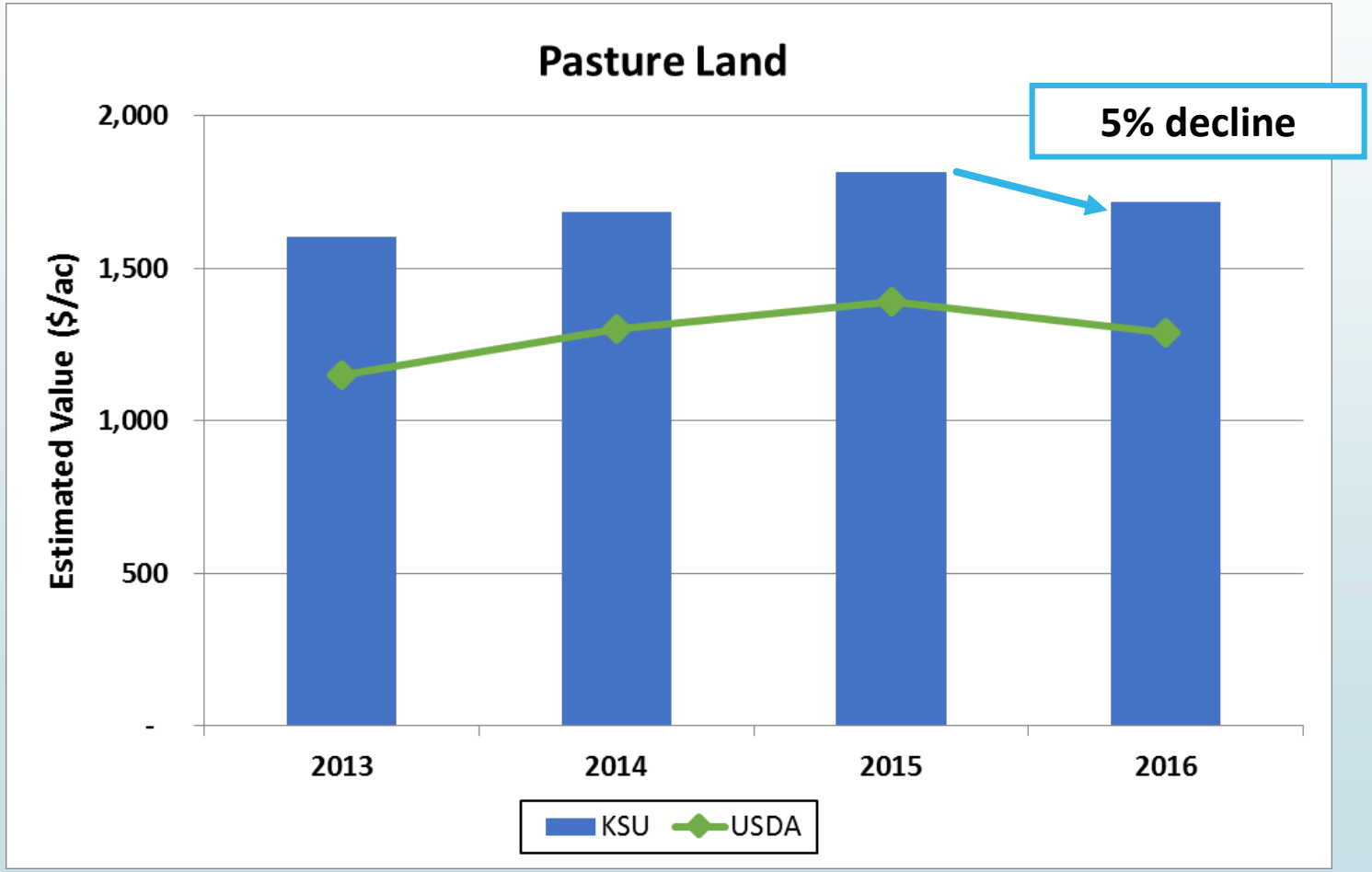
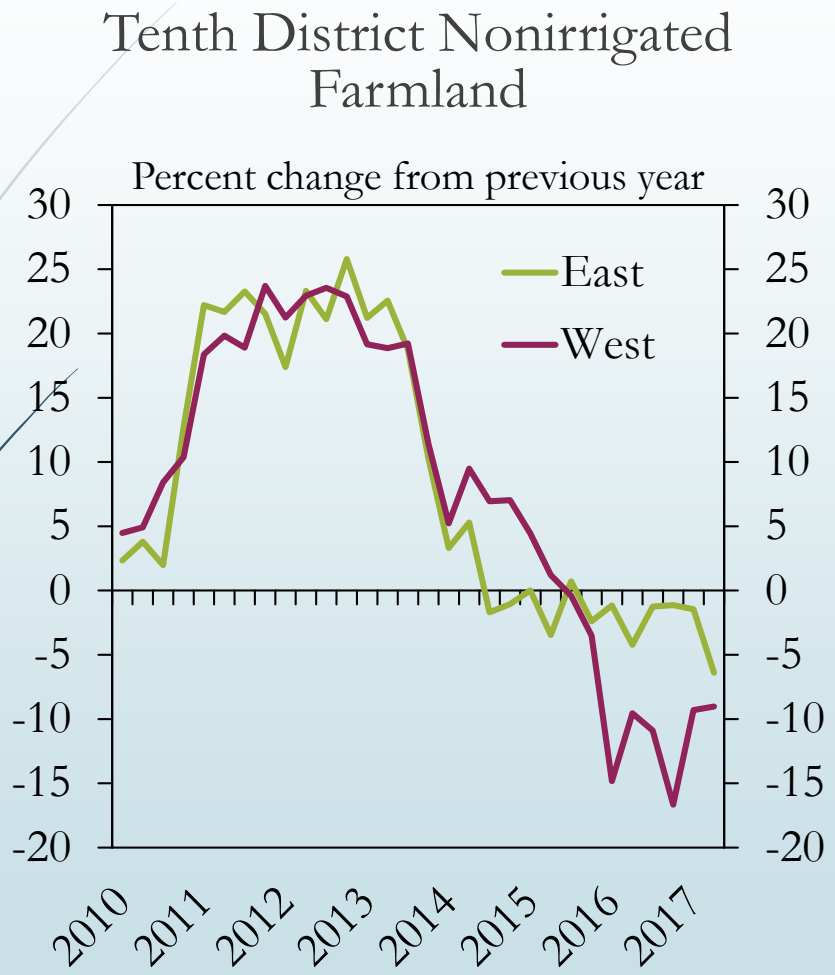
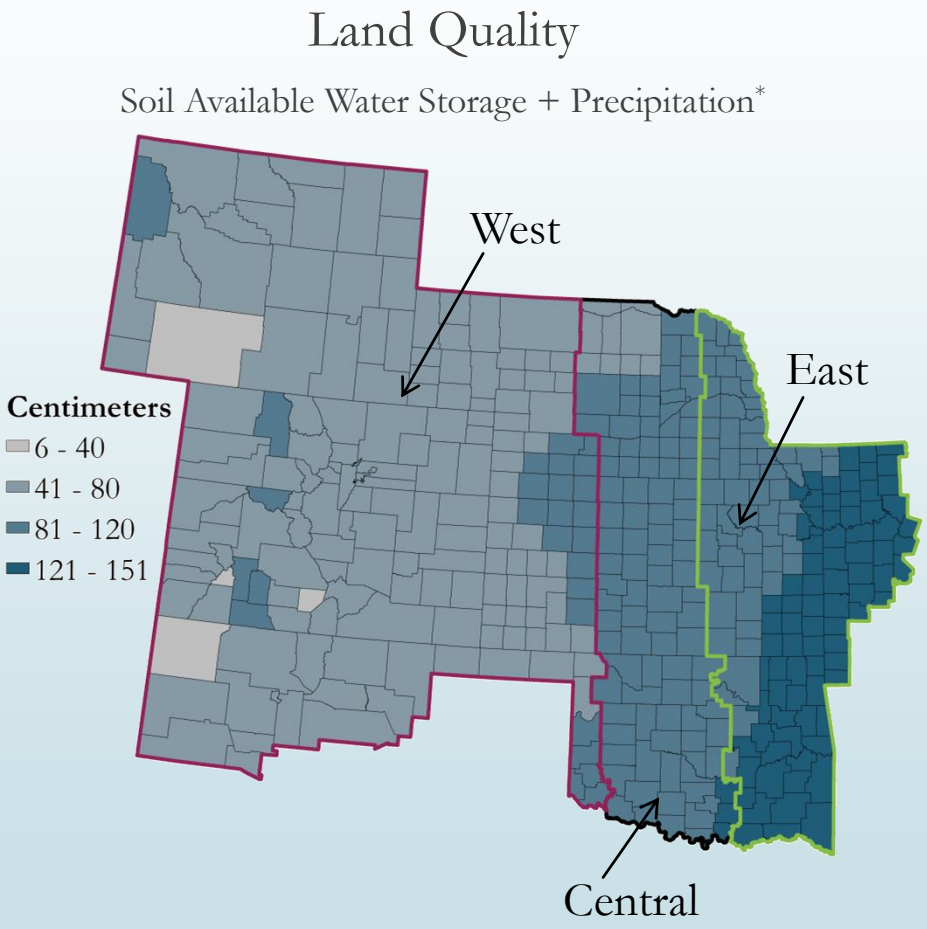


Variability in Land Values





*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

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?

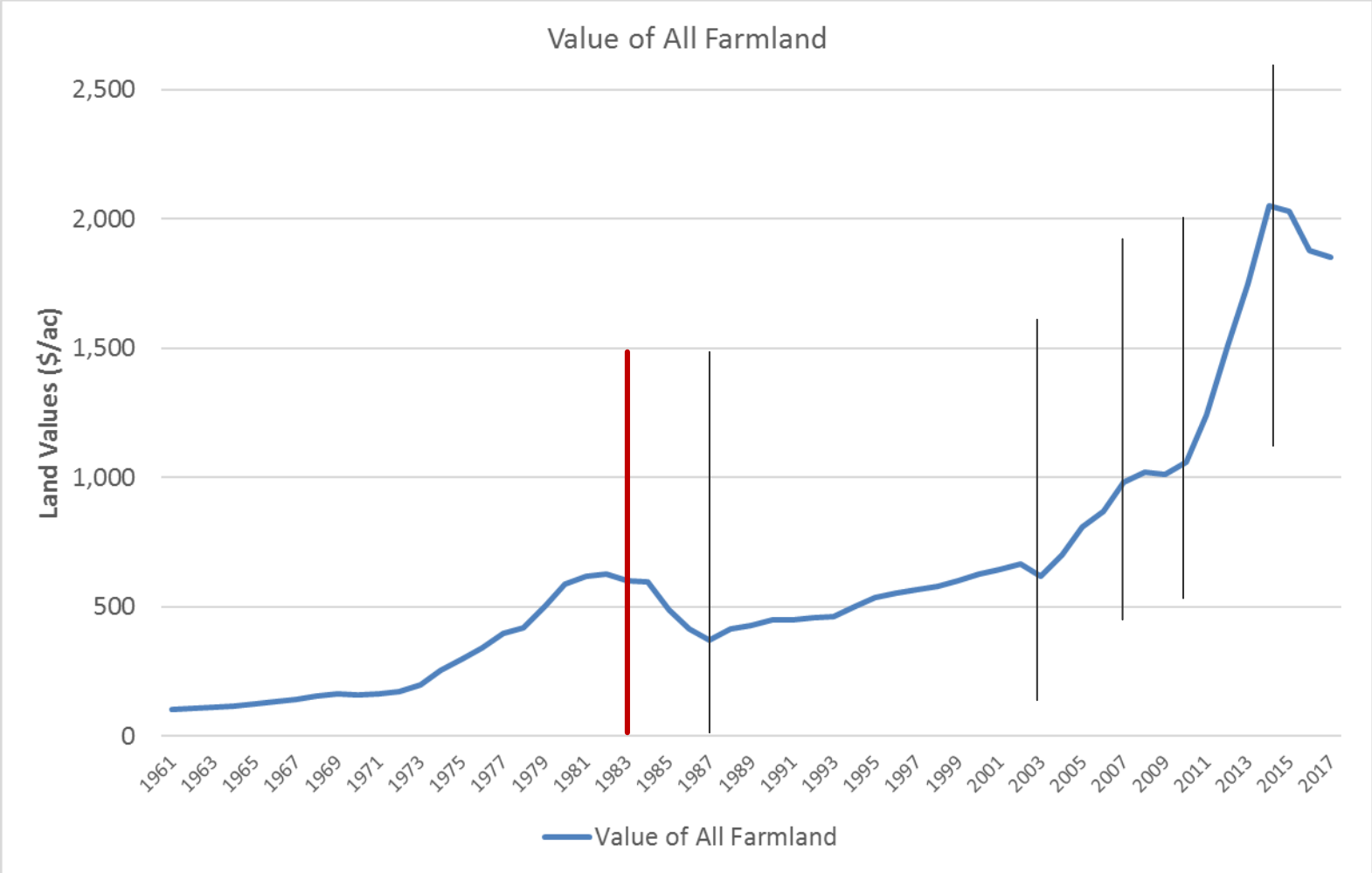
Literature Review

- 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?

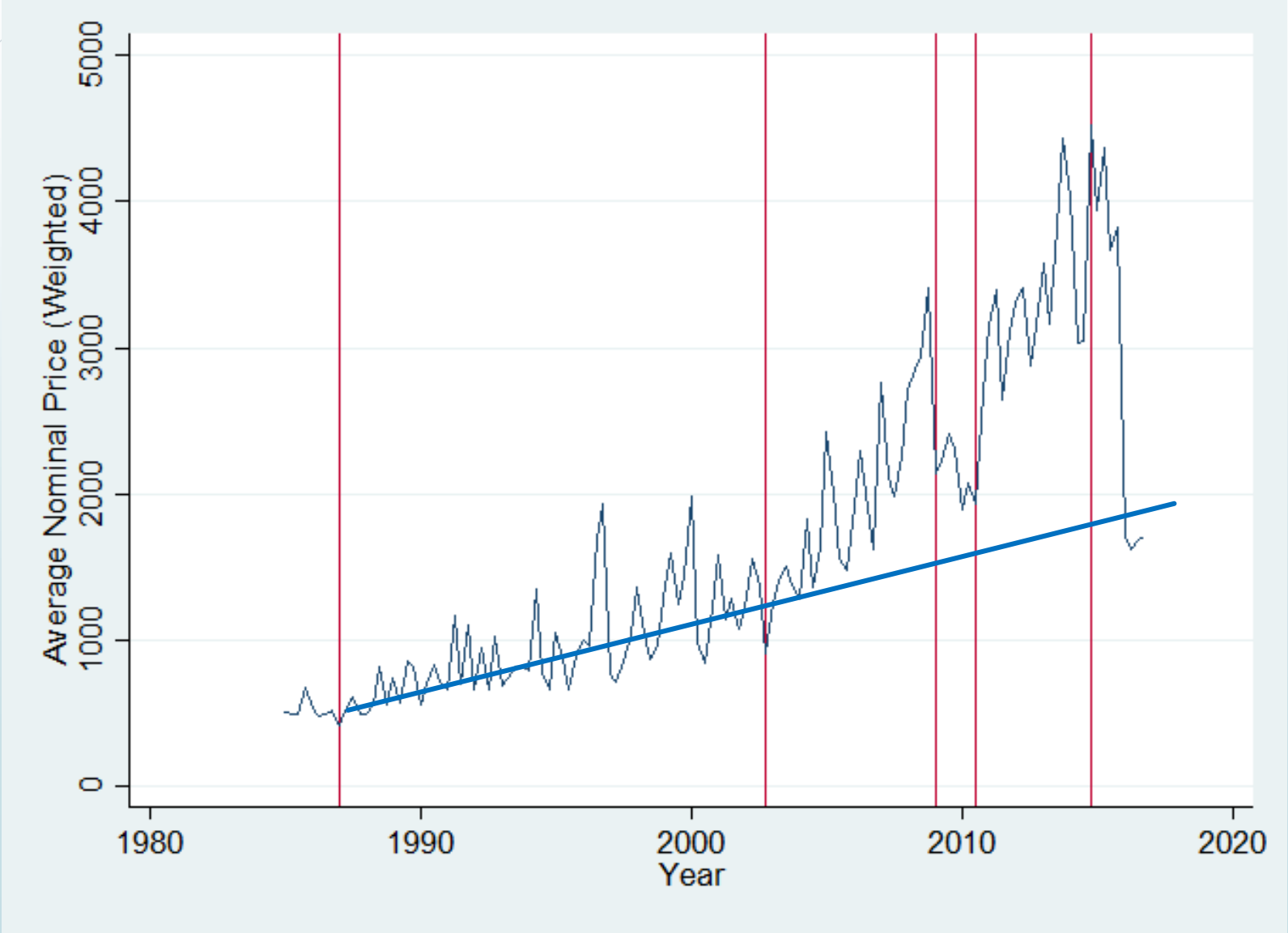
Dataset Construction

- 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

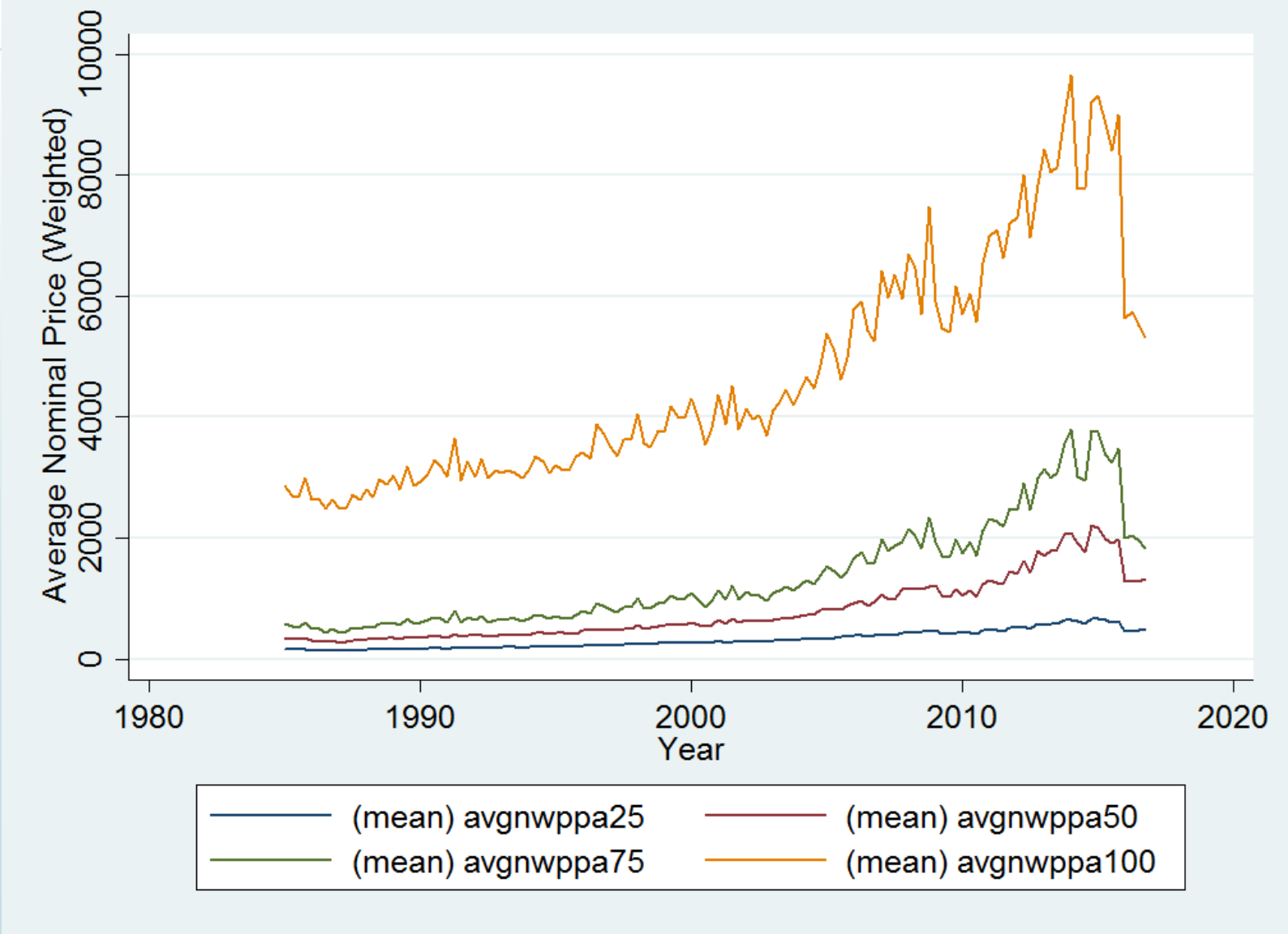
Kansas Land Values - USDA



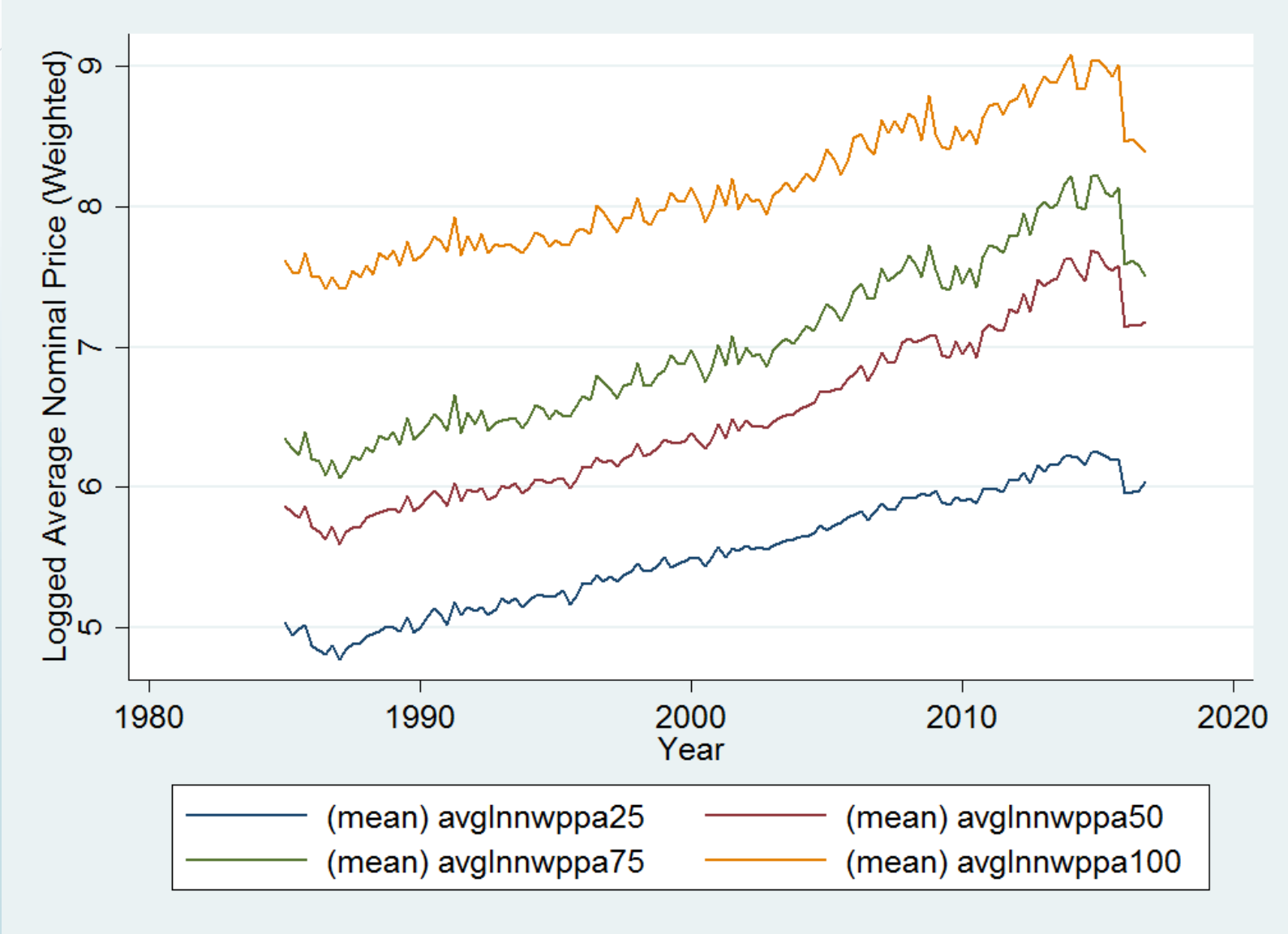
Kansas Land Values – Sales Data



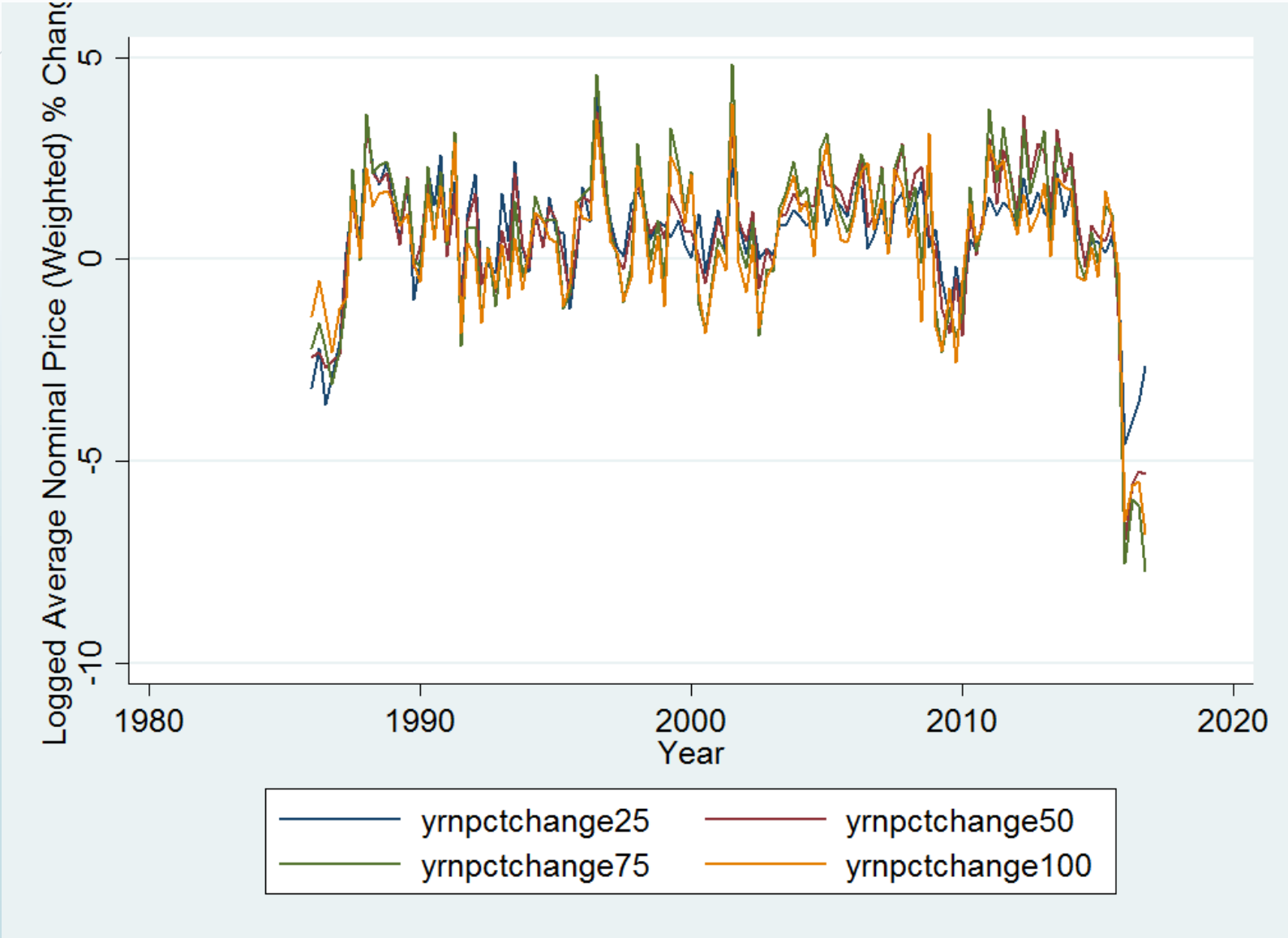
Kansas Land Values by Quartile



Kansas Land Values by Quartile



Kansas Land Values - % Change



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