

Introduction to Farmland Market: Iowa and Beyond

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Econ 235, Feb 7, 2017



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The new Mike Duffy



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A Quick Introduction: Dr. Wendong Zhang

- Grown up in a rural county in NE China
- Attended college in Shanghai and Hong Kong
- Ph.D. in Ag Econ in 2015 from Ohio State
- 2012 summer intern at USDA-ERS on farm economy and farmland values
- Research and extension interests: land value, land ownership, agriculture and the environment, China Ag

China's Provinces



My
Hometown:
Shenxian,
Shandong
Province



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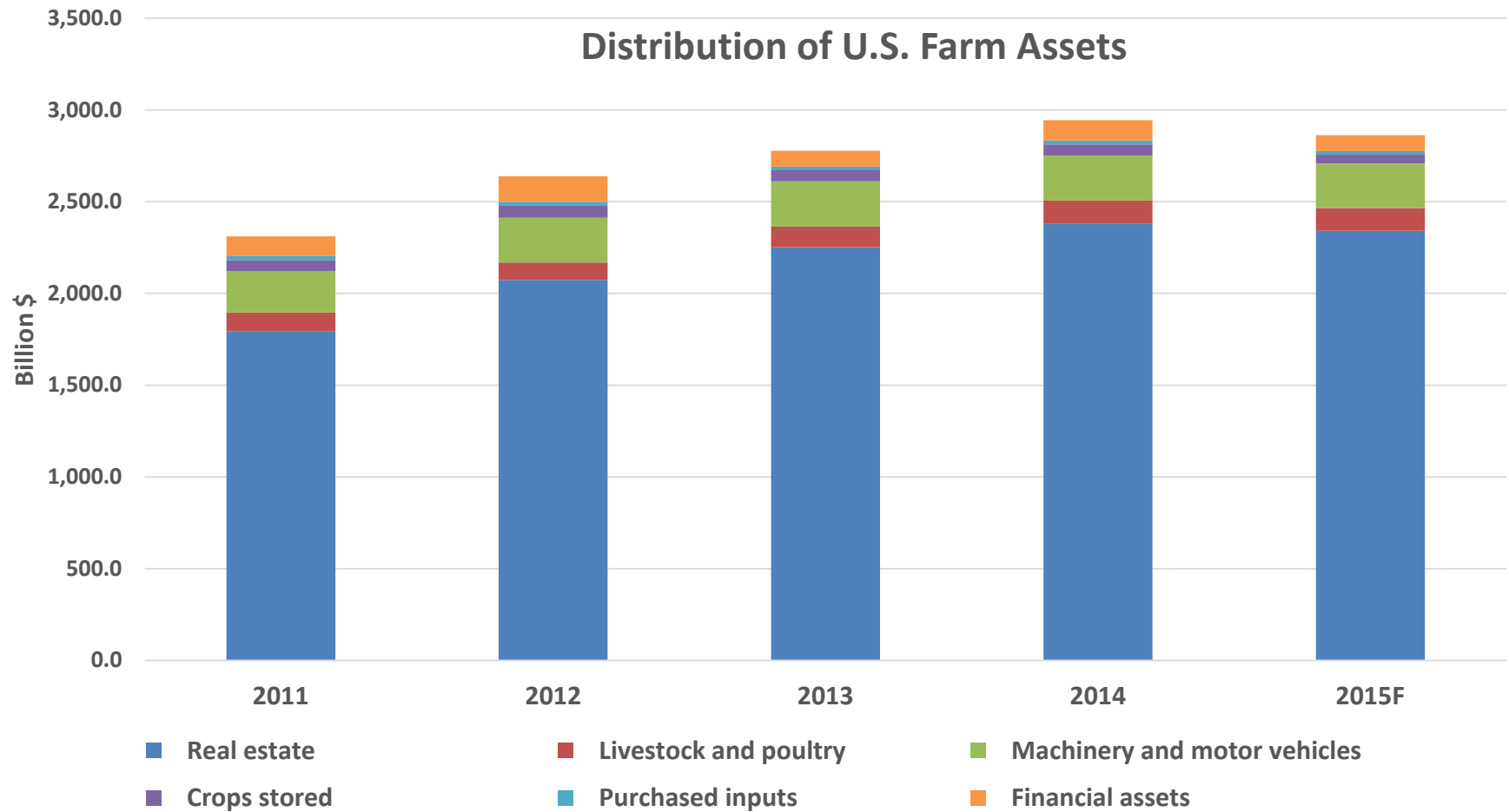
莘县新闻网
<http://sx.lcxw.cn>

Intensification of Land-Use in China

Greenhouse – plastic film - Shandong Province



Why Care About Farmland Market?



What is the price of corn per bushel now? 2012?

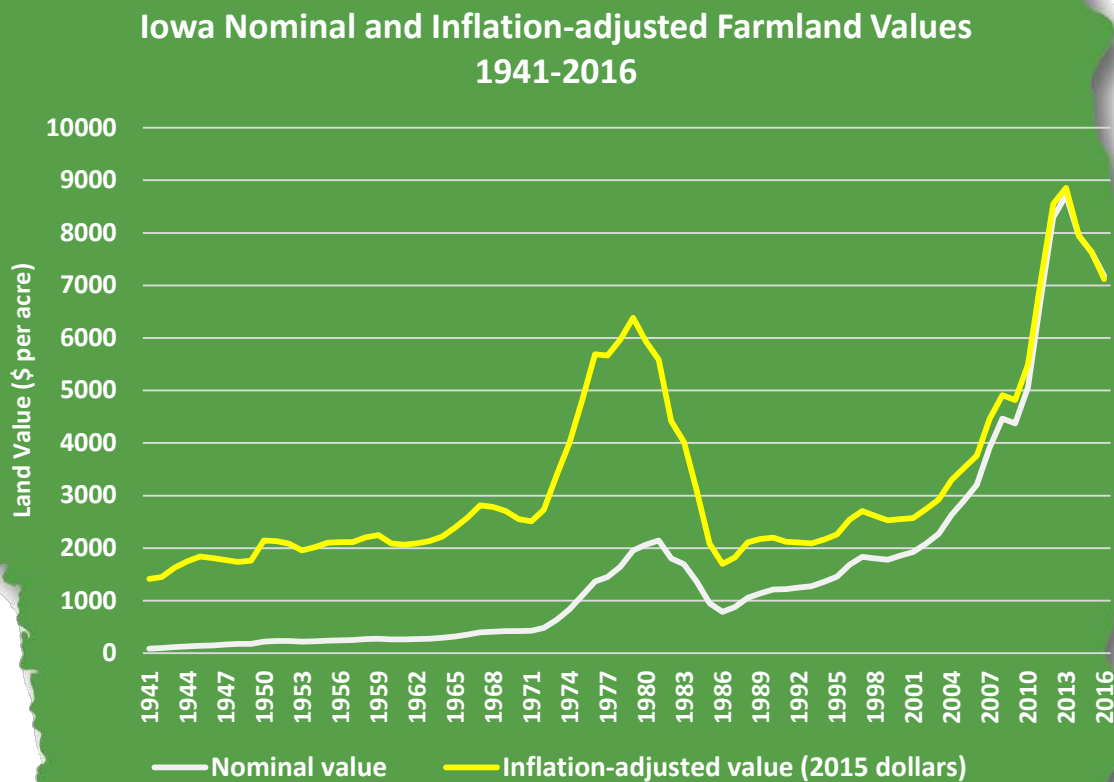
- \$ 2.0
- \$ 7.0
- \$ 3.5
- \$ 4
- \$ 5

The percentage change in Iowa farmland values since Nov 2014?

- Increased 5%
- Increased 10%
- Did not change
- Decreased 5%
- Decreased 10%

AVERAGE VALUES

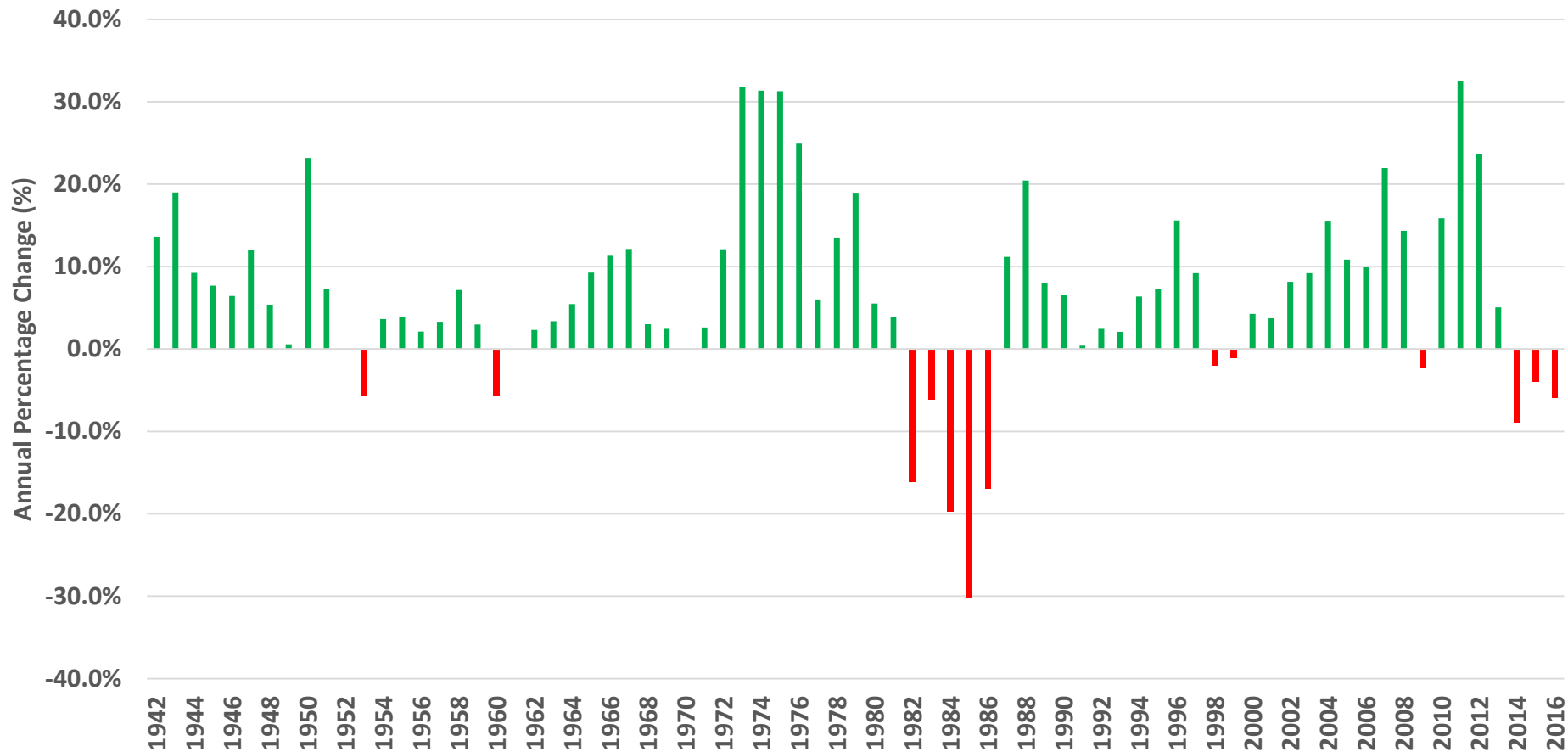
all farmland 1941-2016



\$7,183
As of
Nov 16

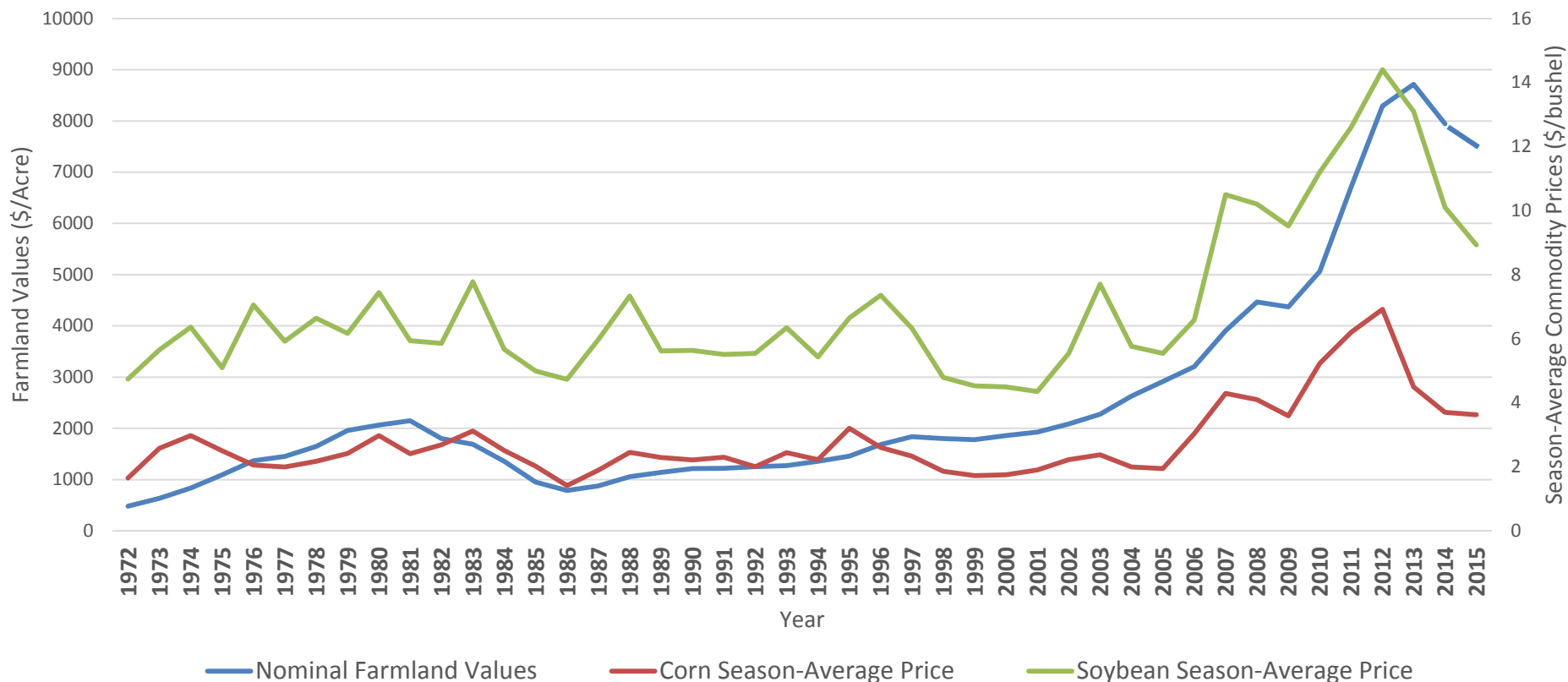
-5.9%

% Change in Nominal Iowa Farmland Values 1942-2016



Farmland Values are driven by agricultural market fundamentals

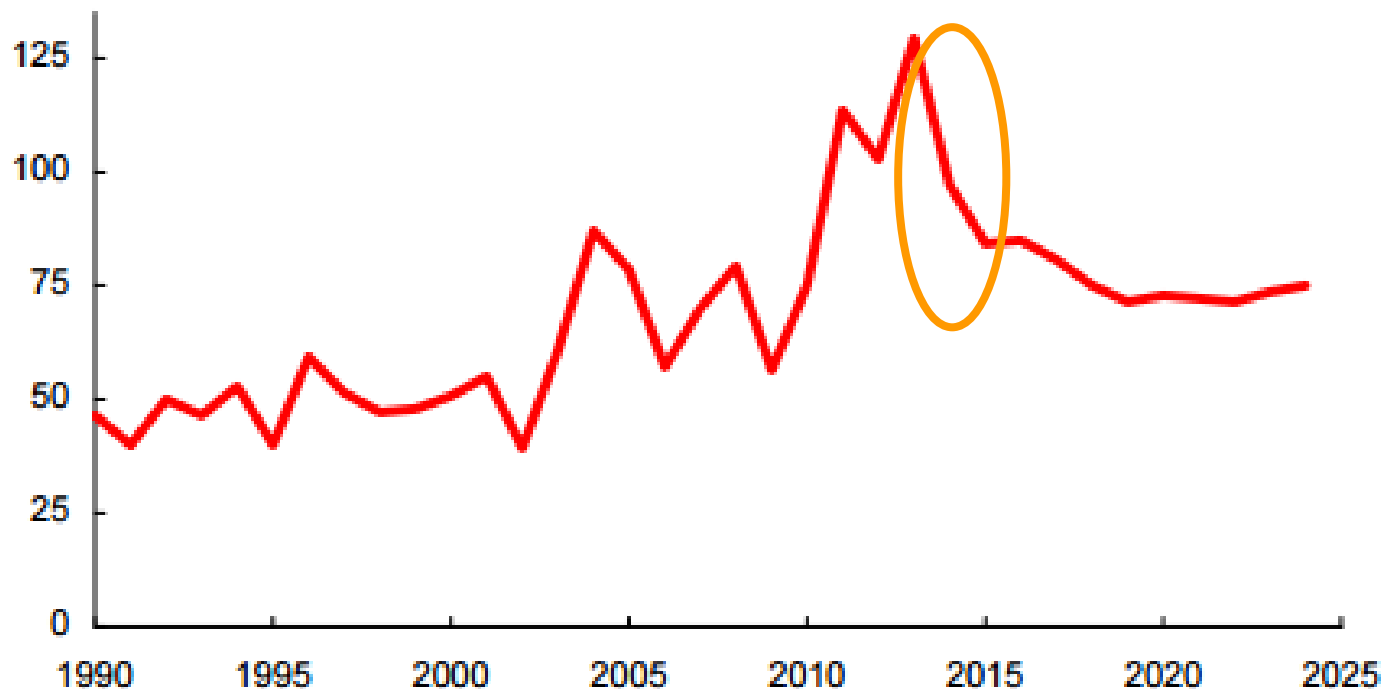
Iowa Farmland Values vs. Commodity Prices 1972-2015



US Farm Income 1990- 2025

U.S. net farm income

Billion dollars



David Ricardo – Founding Father of Land Economics

Legacy: Ricardian Model of Farmland Values

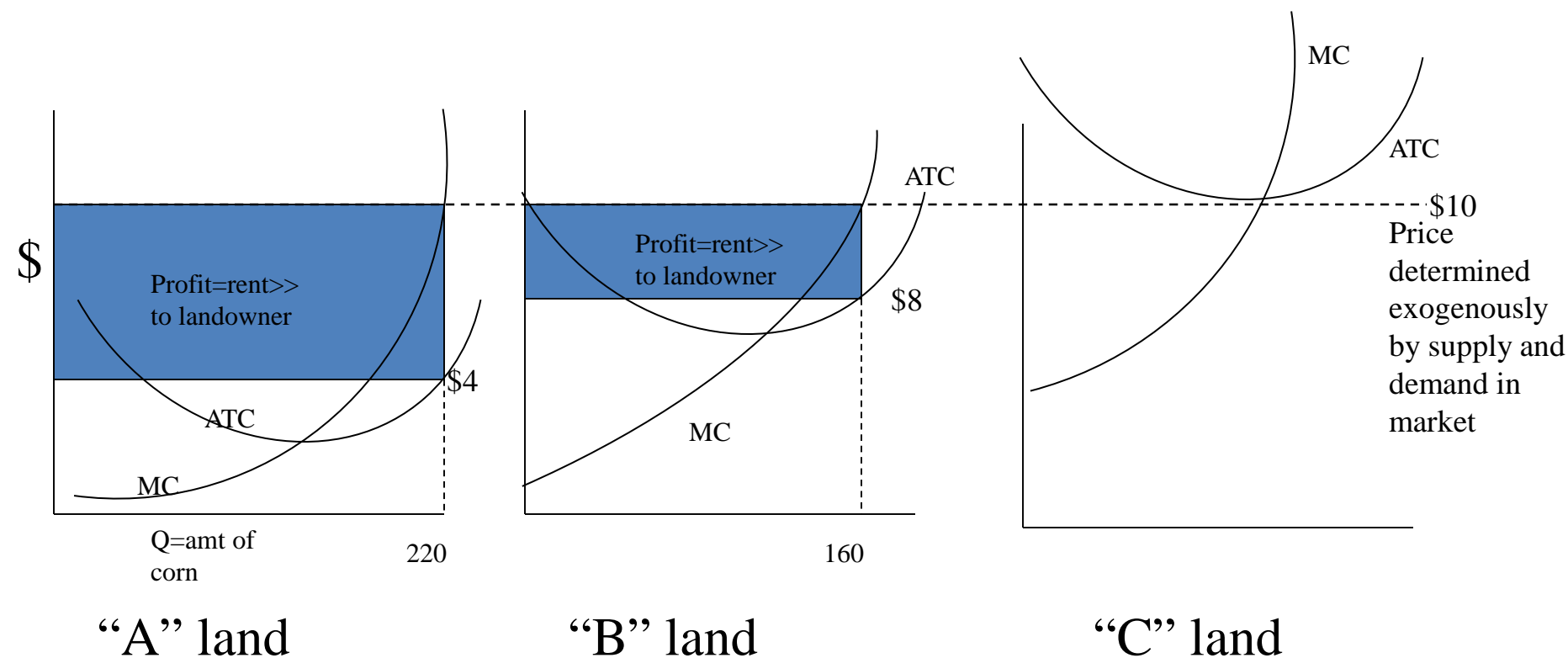
David Ricardo was an English political economist. He was one of the most influential of the classical economists, along with Thomas Malthus, Adam Smith, and James Mill.



Ricardo model

“A” land has lowest production costs= highest rents

“C” land’s rent is 0 because costs are greater than revenue



On fertile land, a farmer can produce same amount of corn with fewer inputs

Market Value of Land – Capitalization Formula

$$PV = \sum_{t=0}^n \frac{R}{(1+i)^t}$$

- For simplicity, you could think of land value as the present value of all future annual land rental payments a landowner could charge
- **PV = R/i**

Land Values by District and Land Quality, Nov 2016

District	Average Value	% Change	High Quality	% Change	Medium Quality	% Change	Low Quality	% Change
Northwest	\$9,243	-4.6%	\$10,650	-5.2%	\$8,468	-4.1%	\$6,019	-3.7%
North Central	\$7,562	-5.0%	\$8,442	-5.9%	\$6,992	-4.9%	\$5,164	-3.9%
Northeast	\$7,313	-7.0%	\$8,892	-7.1%	\$6,994	-6.2%	\$4,847	-7.5%
West Central	\$7,358	-8.7%	\$8,874	-8.4%	\$6,870	-9.4%	\$4,577	-9.9%
Central	\$7,841	-7.8%	\$9,299	-7.8%	\$7,186	-7.4%	\$5,158	-2.5%
East Central	\$7,917	-6.9%	\$9,502	-7.6%	\$7,396	-6.8%	\$5,153	-4.0%
Southwest	\$6,060	-4.9%	\$7,527	-6.3%	\$5,683	-5.9%	\$4,189	2.9%
South Central	\$4,241	-3.6%	\$5,980	-7.2%	\$4,128	-3.6%	\$2,892	5.2%
Southeast	\$6,716	-2.6%	\$9,265	-2.8%	\$6,283	-3.7%	\$3,783	-0.4%
Iowa Avg.	\$7,183	-5.9%	\$8,758	-6.5%	\$6,705	-5.9%	\$4,665	-3.5%

Livestock and Crop Inventory by District

	Inventory 2012				Harvested Acres 2015	
	Chickens, Layers	Hogs	Milk Cows	Cattle	Corn	Soybean
Northwest	30%	26%	29%	22%	15%	16%
North Central	64%	16%	4%	6%	14%	13%
Northeast	1%	12%	51%	16%	12%	8%
West Central	0%	13%	1%	13%	15%	16%
Central	3%	13%	1%	7%	15%	14%
East Central	1%	5%	10%	11%	10%	10%
Southwest	0%	2%	0%	9%	7%	9%
South Central	0%	2%	1%	9%	4%	5%
Southeast	1%	11%	3%	6%	7%	8%
State Inventory	20.4 million	20.4 million	0.17 million	2.34 million	13.2 million	9.8 million

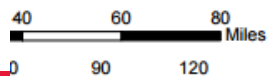
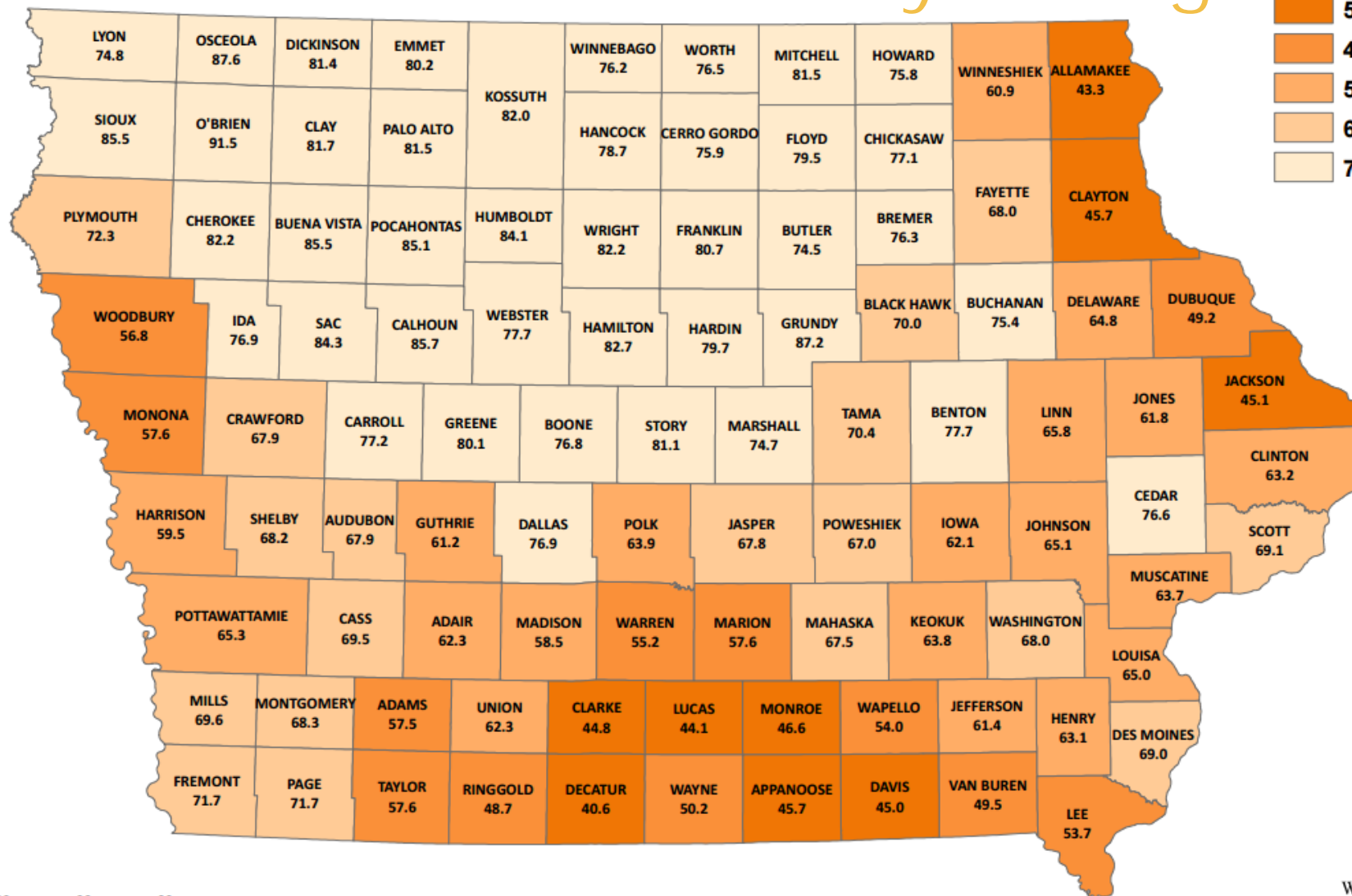
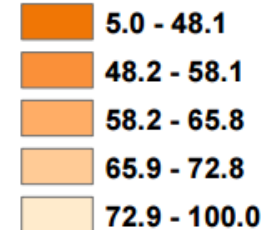
Dollar Values

- \$6,500 or less
- \$6,501 to \$7,500
- \$7,501 to \$8,000
- \$8,001 to \$9,000
- \$9,001 or more



CSR2 – Corn Suitability Rating

Weighted Mean CSR2



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Source: ISU Agronomy



CARD

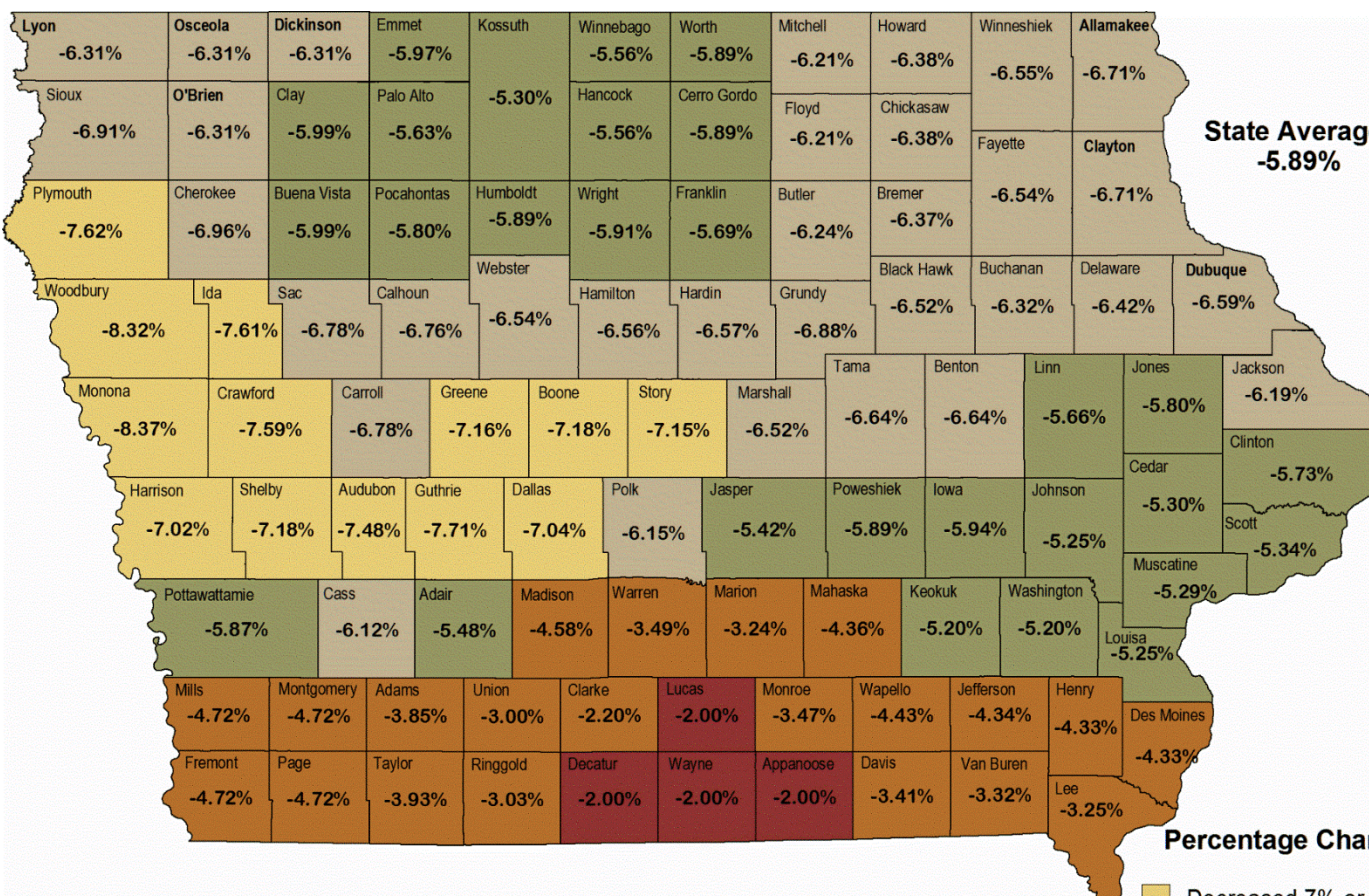
Center for Agricultural and Rural Development

Percent Changes in Land Values from Nov 2015

State Average
-5.89%

Percentage Change

- Decreased 7% or more
- Decreased 6 to 7%
- Decreased 5 to 6%
- Decreased 2 to 5%
- Decreased less than 2%

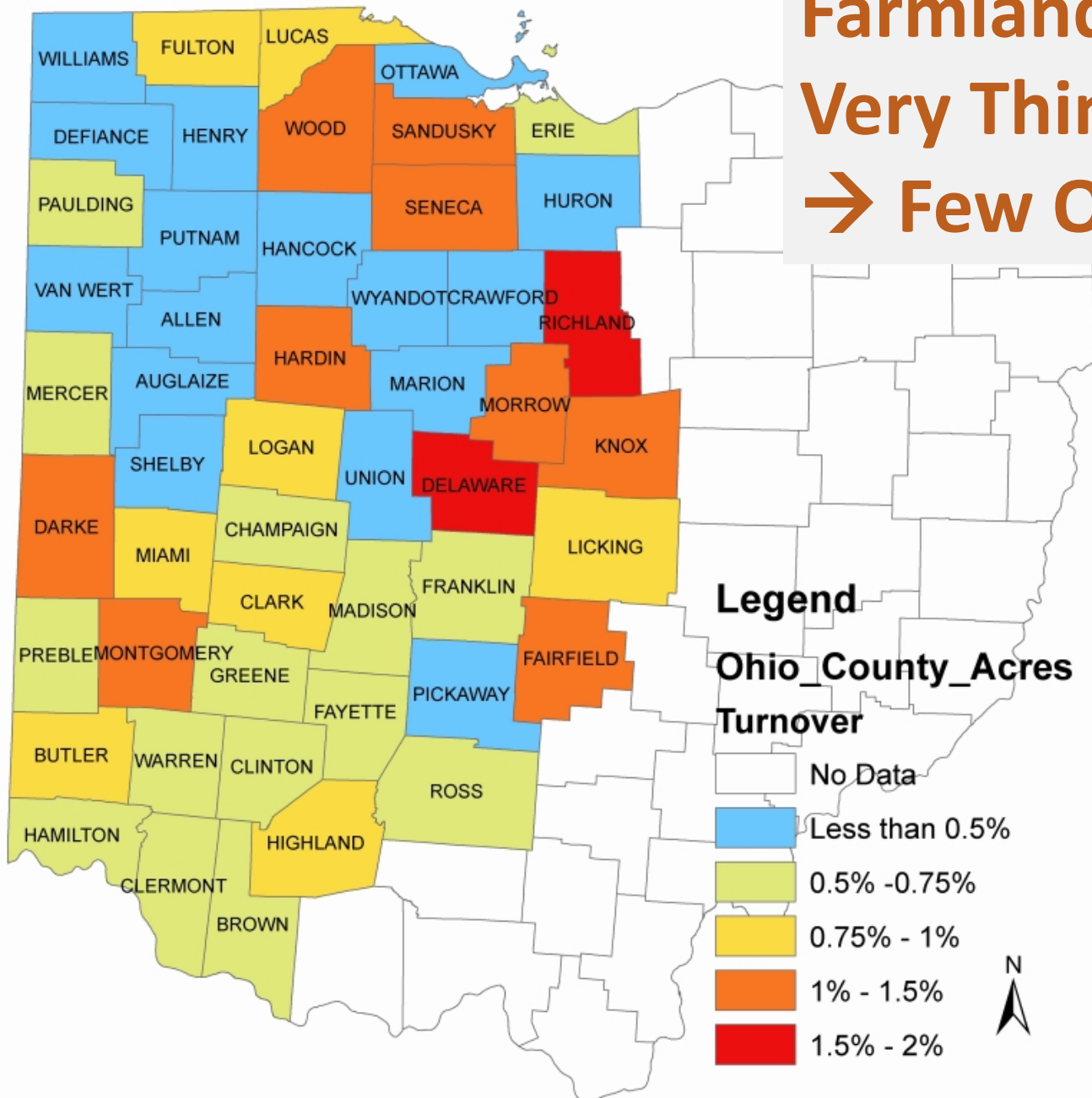


Farmland Market is Very Thin! → Few Observations

Annual
Agricultural
turnover ratio
2001 - 2010

Blue: <0.5%
Red: 1.5-2%

Illinois
<0-3%>

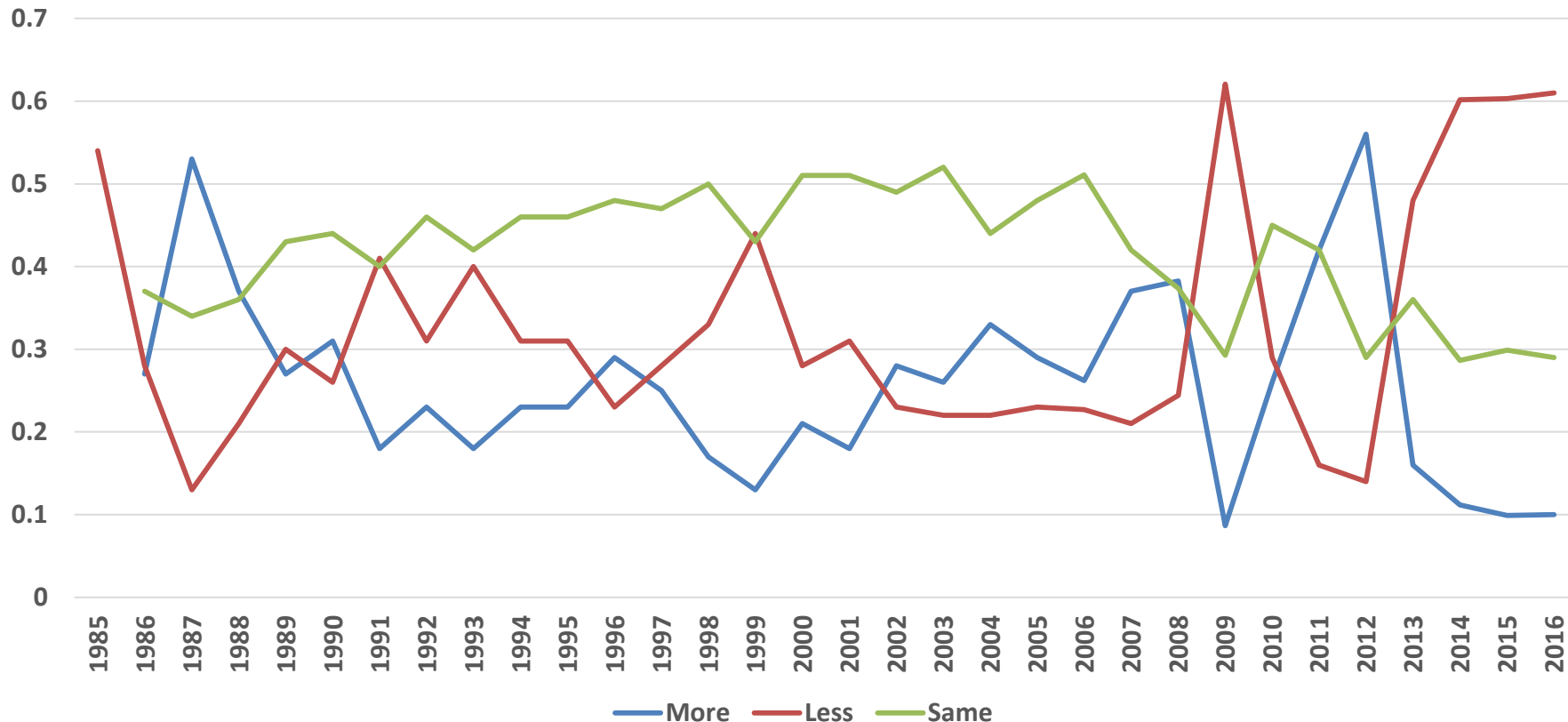


CARD

Center for Agricultural and Rural Development

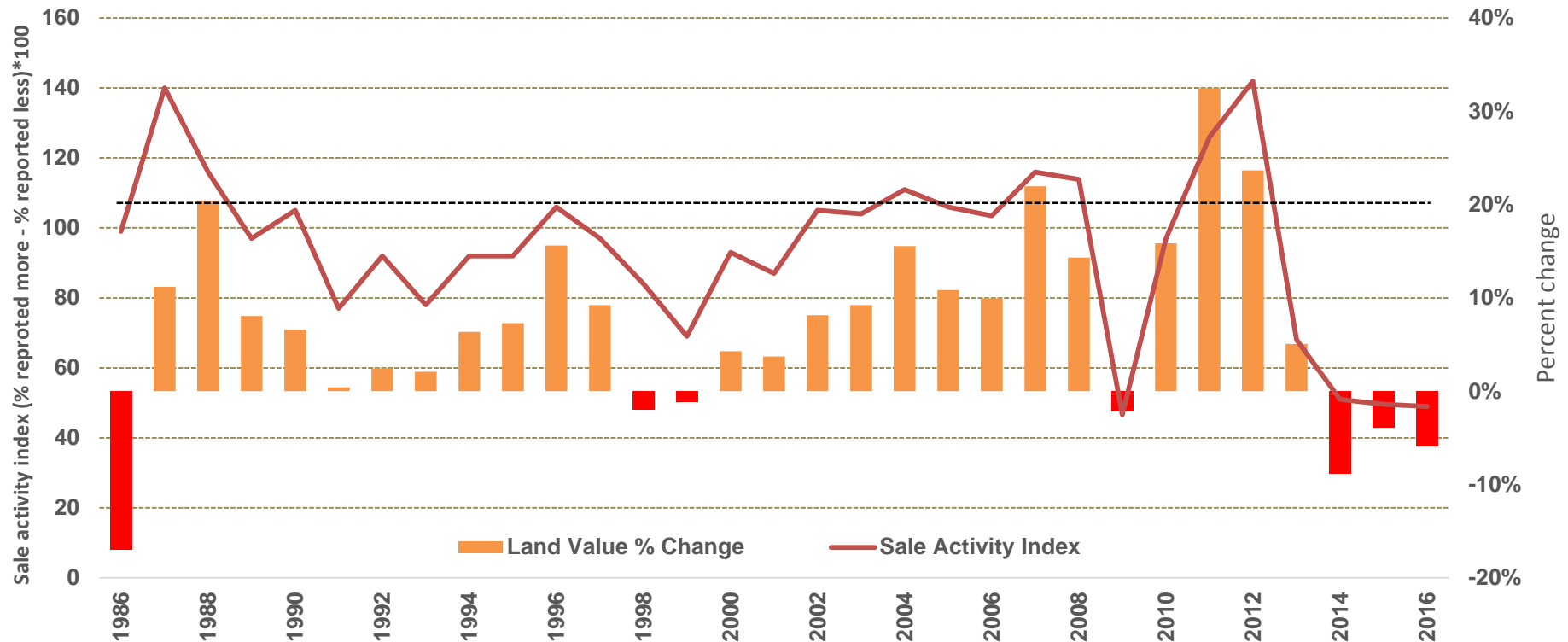
Iowa Farmland Sale Activity Relative to Last Year 1985-2016

Iowa Farmland Sale Activity Change 1989-2016



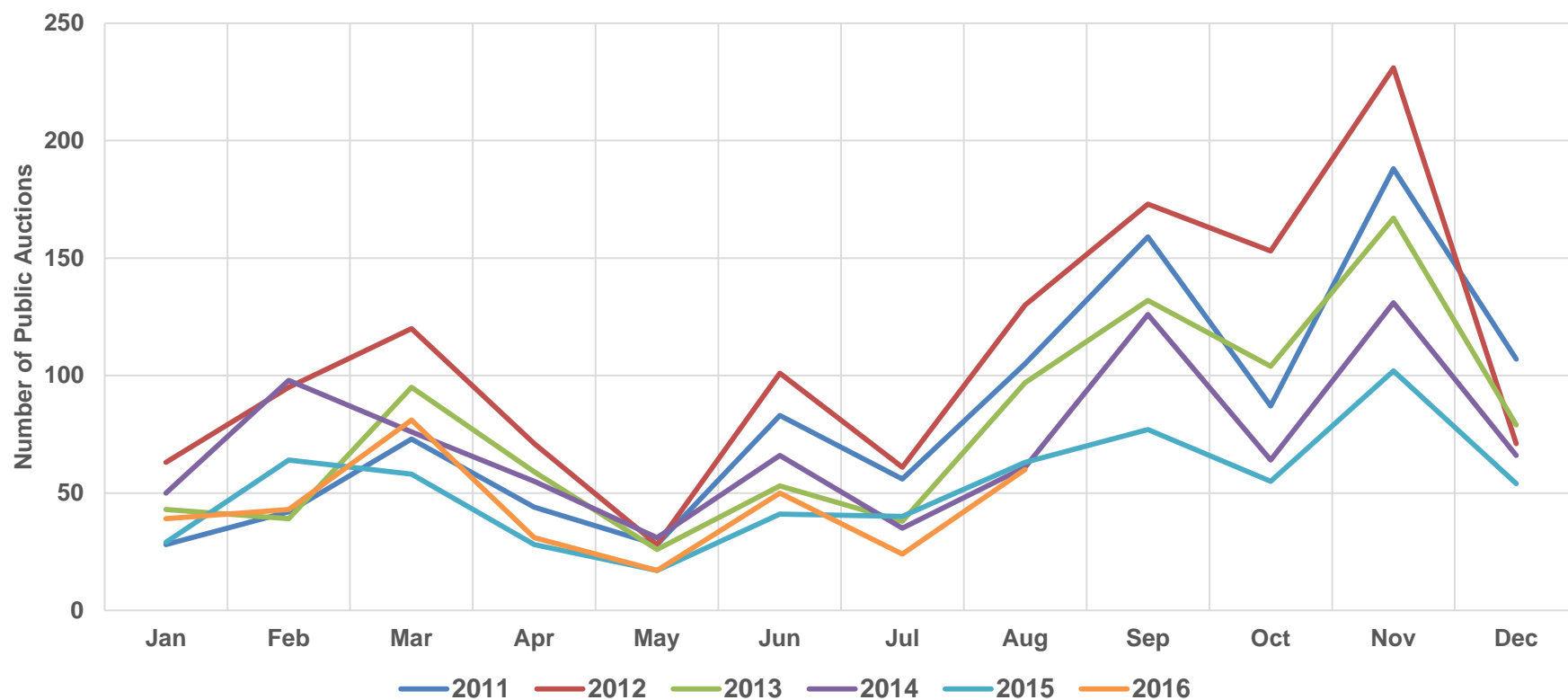
Farmland supply tends to be tighter in down years

ISU sale activity index and percent change in
Iowa land value, 1986-2016
(% reported more sales - % reported less sales) + 100



Limited farmland supply tends to bolster land values

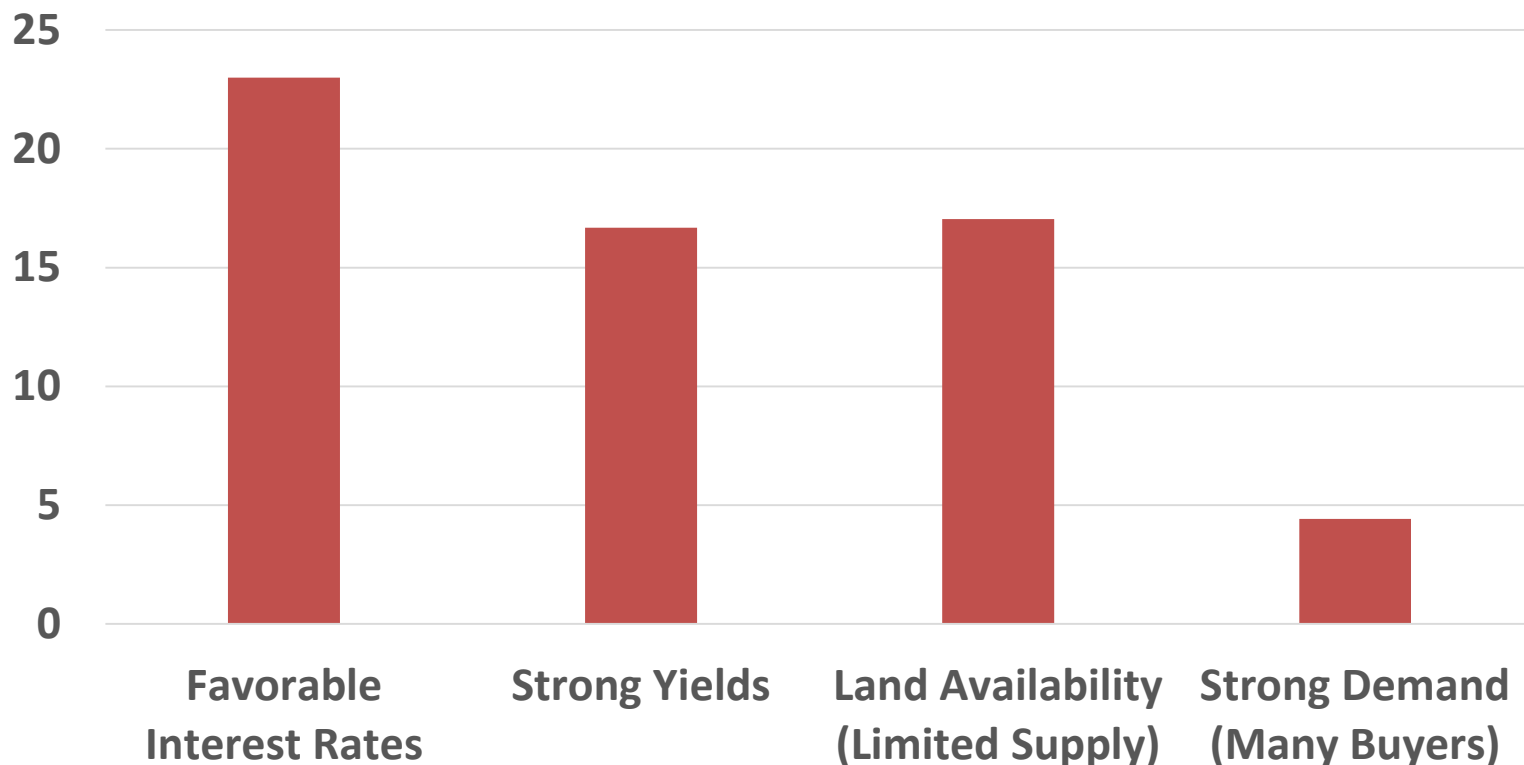
Number of Public Auctions by Month 2011-2016



Looking Ahead

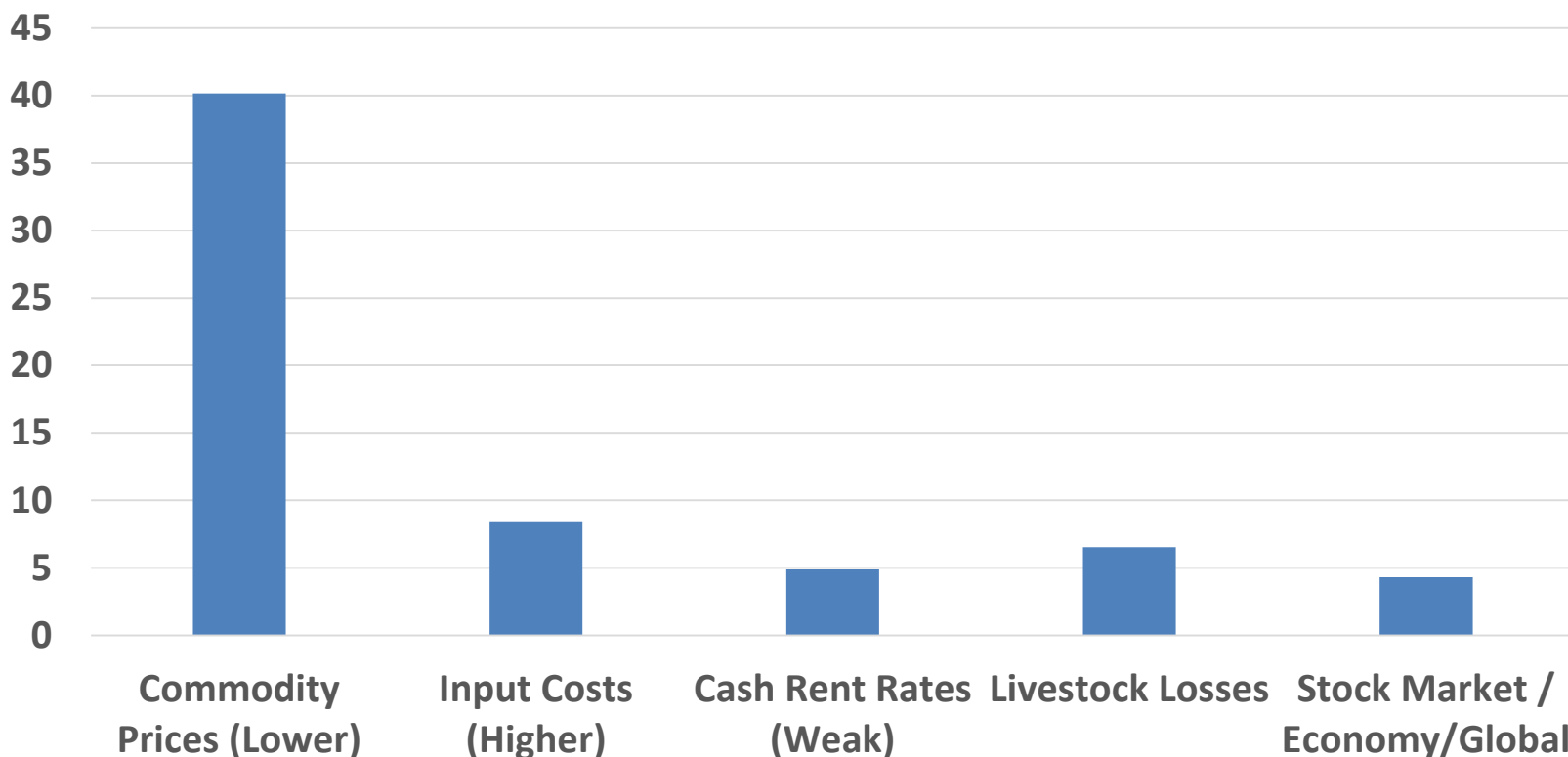
Major Positive Factors Affecting Iowa Farmland Market, 2016

Positive Factors, 2016 (Percent)

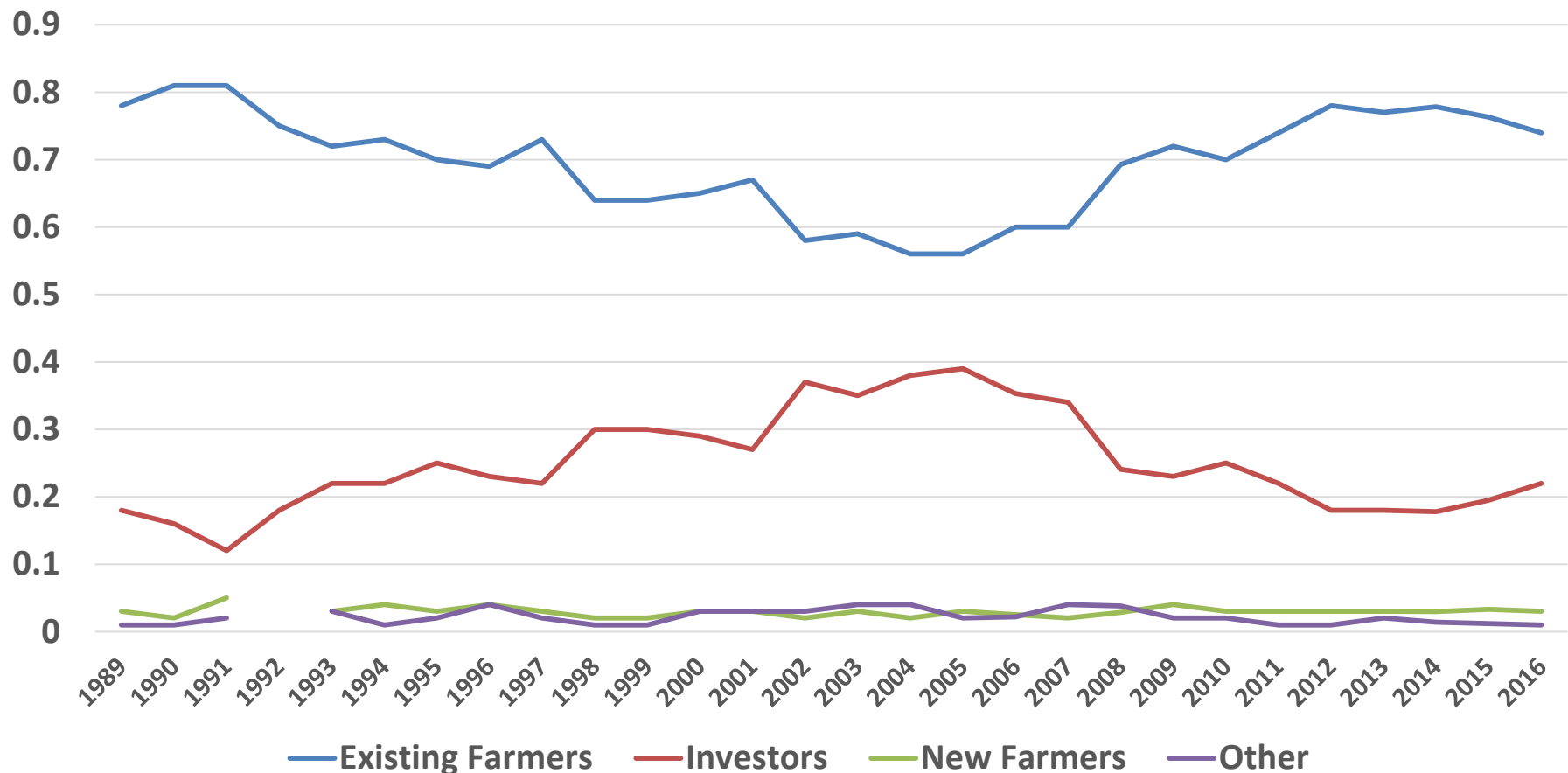


Major Negative Factors Affecting Iowa Farmland Market, 2016

Negative Factors, 2016 (Percent)



Iowa Farmland Purchases by Buyer Types 1989-2016



Iowa Landowners tend to hold the farmland

Years of ownership	% of Iowa Farmland
Less than 10 years	24%
10-20 Years	21%
20-30 Years	19%
30-40 Years	15%
> 40 Years	20%

Iowa Farmland Purchases by Seller Types, 2016

	Active Farmers	Retired Farmers	Estate Sales	Investors	Other
	PERCENT				
Northwest	12	17	64	5	3
North Central	8	17	61	10	4
Northeast	14	34	43	6	5
West Central	12	25	57	5	2
Central	13	22	53	8	4
East Central	11	24	53	9	2
Southwest	15	24	47	13	1
South Central	17	24	37	19	3
Southeast	11	24	57	10	2
STATE	12	23	53	9	3

Cash Crop Price Predictions for Nov 2017, 2018, 2020

	Cash Corn Prices			Cash Soybean Prices		
	2017	2018	2020	2017	2018	2020
Northwest	\$ 3.34	\$ 3.65	\$ 3.98	\$ 9.25	\$ 9.61	\$ 10.32
North Central	\$ 3.42	\$ 3.59	\$ 3.93	\$ 9.16	\$ 9.46	\$ 10.01
Northeast	\$ 3.41	\$ 3.59	\$ 3.95	\$ 9.19	\$ 9.28	\$ 9.76
West Central	\$ 3.34	\$ 3.59	\$ 4.02	\$ 9.12	\$ 9.33	\$ 10.06
Central	\$ 3.36	\$ 3.50	\$ 3.77	\$ 9.17	\$ 9.40	\$ 9.86
East Central	\$ 3.42	\$ 3.58	\$ 3.89	\$ 9.26	\$ 9.51	\$ 10.00
Southwest	\$ 3.31	\$ 3.56	\$ 3.94	\$ 9.15	\$ 9.42	\$ 10.09
South Central	\$ 3.36	\$ 3.59	\$ 3.90	\$ 9.51	\$ 9.76	\$ 10.35
Southeast	\$ 3.50	\$ 3.83	\$ 4.17	\$ 9.49	\$ 9.59	\$ 10.08
STATE	\$ 3.38	\$ 3.60	\$ 3.94	\$ 9.24	\$ 9.48	\$ 10.06

2016 Estimated Land and Commodity Prices

AVG. Estimate

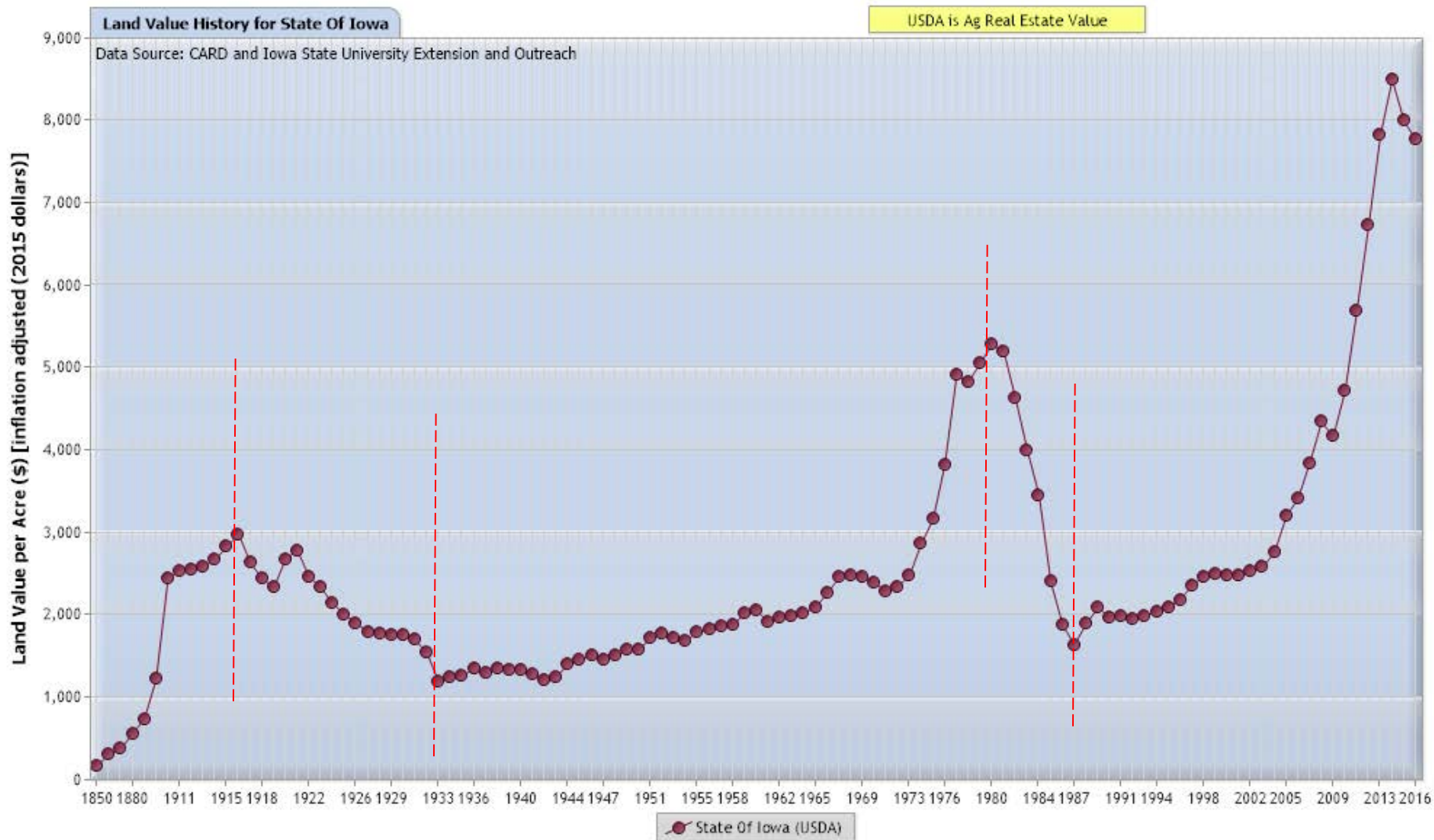
LAND:

	NW	NE	SW	SE	STATE
Nov 2016	\$ 8,358	\$ 8,191	\$ 6,958	\$ 7,320	\$ 7,776
Nov 2017	\$ 8,137	\$ 7,991	\$ 6,991	\$ 6,869	\$ 7,572
Nov 2020	\$ 8,884	\$ 8,758	\$ 7,698	\$ 7,614	\$ 8,303
Nov 2025	\$ 10,199	\$ 9,756	\$ 8,834	\$ 8,681	\$ 9,446
Nov 2040	\$ 14,487	\$ 12,818	\$ 11,833	\$ 11,988	\$ 12,866

Commodity Prices

	CORN	SOYBEAN
Nov 2016	\$ 3.75	\$ 9.44
Nov 2017	\$ 3.73	\$ 10.12
Nov 2020	\$ 4.32	\$ 10.78

Iowa Ag Real Estate Values 1850-2016



A replay of 1920s or 1980s farm crisis?

Average % change in inflation-adjusted values per year

Golden Eras

	<i>Land</i>	<i>Gross Income</i>	<i>Net Income</i>
1910-1920	1.2%	0.8%	0.2%
1973-1981	9.7%	0.9%	-3.2%
2003-2013	11.1%	4.5%	8.1%

Crises and Declines

	<i>Land</i>	<i>Gross Income</i>	<i>Net Income</i>
1921-1933	-5.8%	-1.9%	-1.0%
1981-1987	-15.0%	-2.5%	2.6%
2013-2016	-6.0%*	-2.7%	-9.5%

Key Indicators to Watch

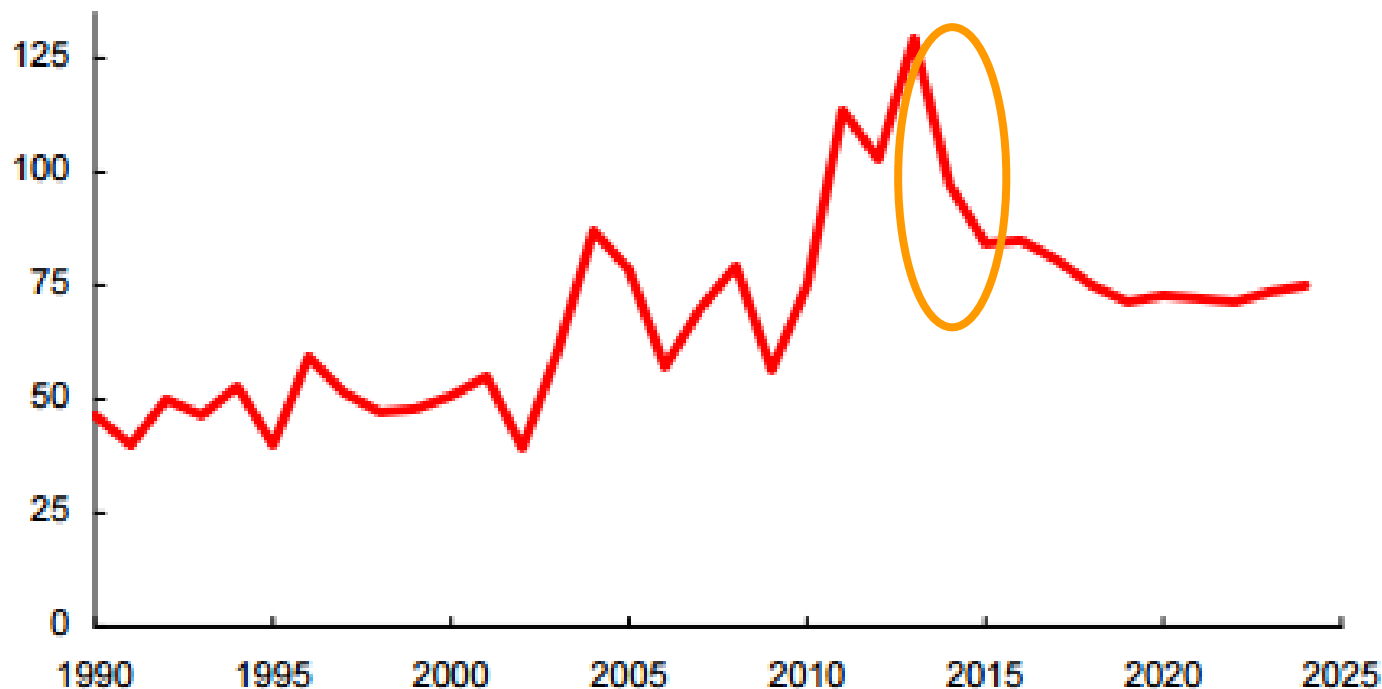
$$\text{Land Value} = \frac{\text{net income}}{\text{interest rate}}$$

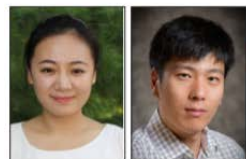
- USDA Farm Income Forecast
 - Price Outlook
 - Ag Exports / Exchange Rate
 - China
 - Ethanol, E-85, RFS
- Fed's move on Interest Rate
- Ag Loan Delinquency; Vendor Credit

US Farm Income 1990- 2025

U.S. net farm income

Billion dollars





Of maize and markets: China's new corn policy

By Qianrong Wu, economics graduate student, qianrong@iastate.edu; Wendong Zhang, extension economist, wdzhang@iastate.edu

2017

美国农业大州爱荷华州的农畜产品在世界市场上长期占据重要地位，现任州长特里·布兰斯塔德已被特朗普政府提名为下一届驻华大使。爱荷华州立大学中国留学生对中国玉米产业政策的一份研究报告获得州农业部长Bill Northey 的推荐转发，芝华特对此深度报告进行了翻译整理。

玉米与市场：谈中国的新玉米政策

作者：Qianrong Wu Wendong Zhang

翻译：芝华数据 李佳璇



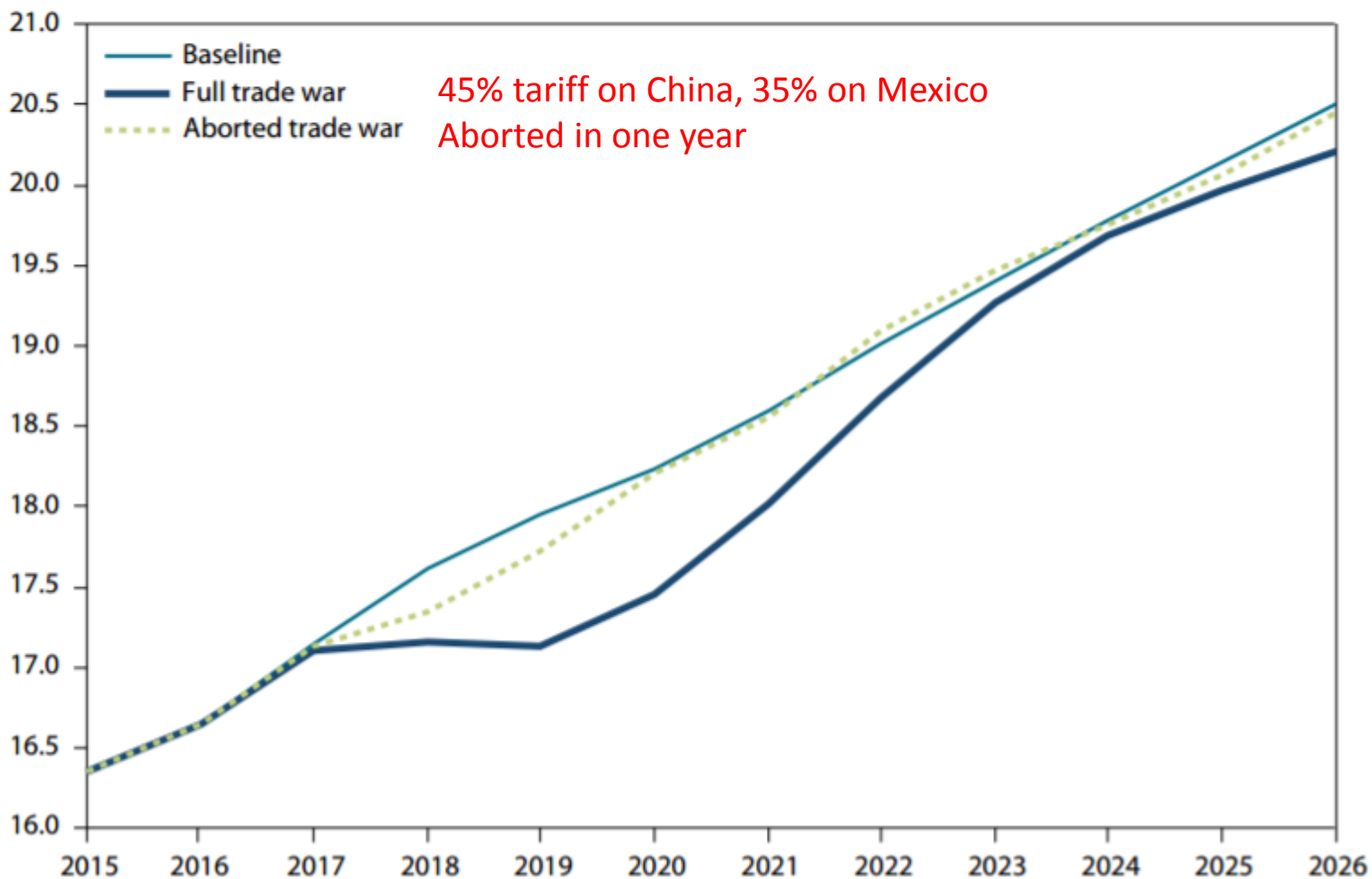
Federal Reserve raises interest rates for second time in a decade, expects 3 hikes in 2017

The Washington Post

By Jim Tankersley December 14 at 3:30 PM

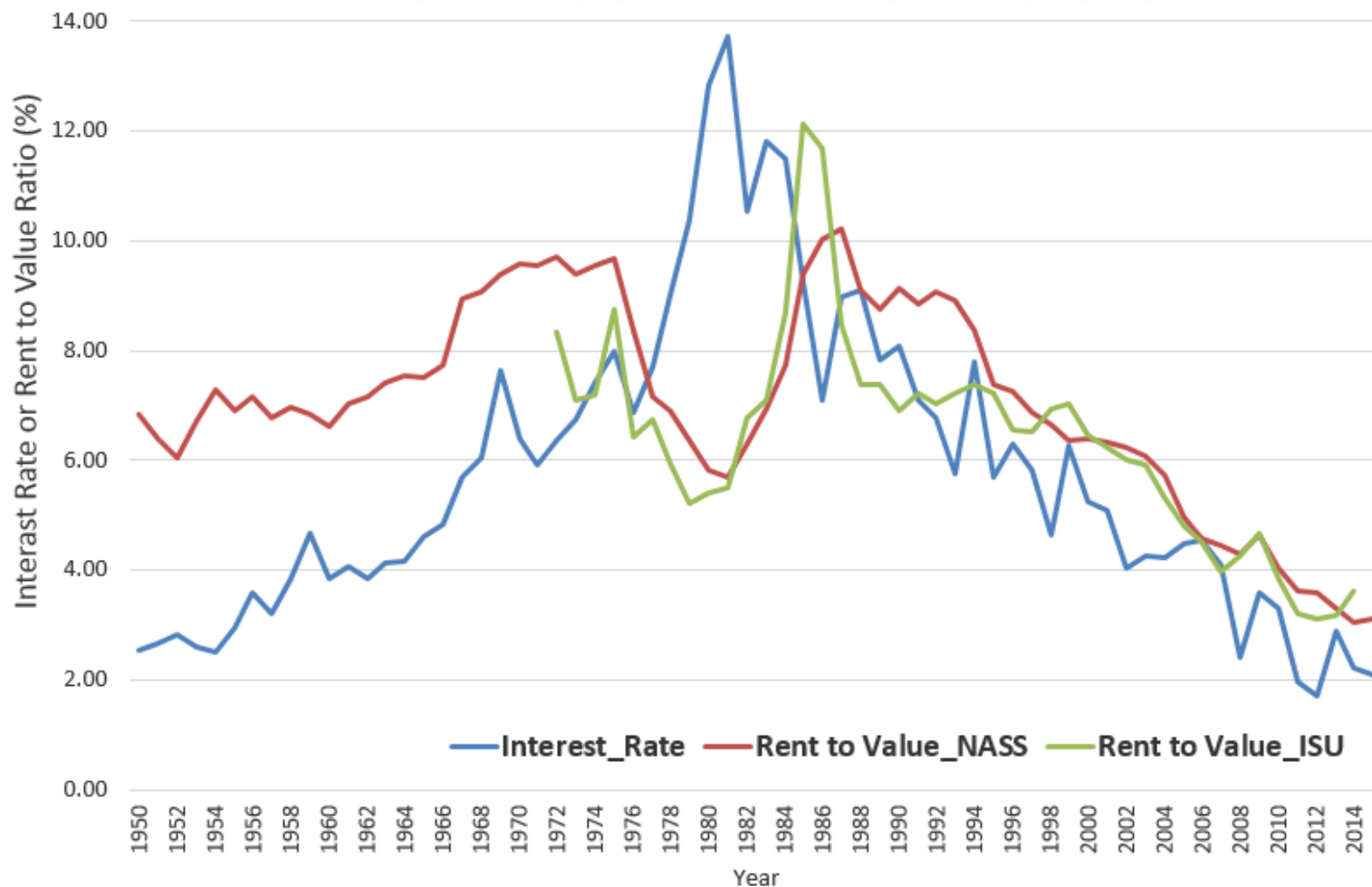
Figure 2.2 Projected US GDP under baseline, full trade war, and aborted trade war scenarios, 2015–26

trillions of 2009 US dollars



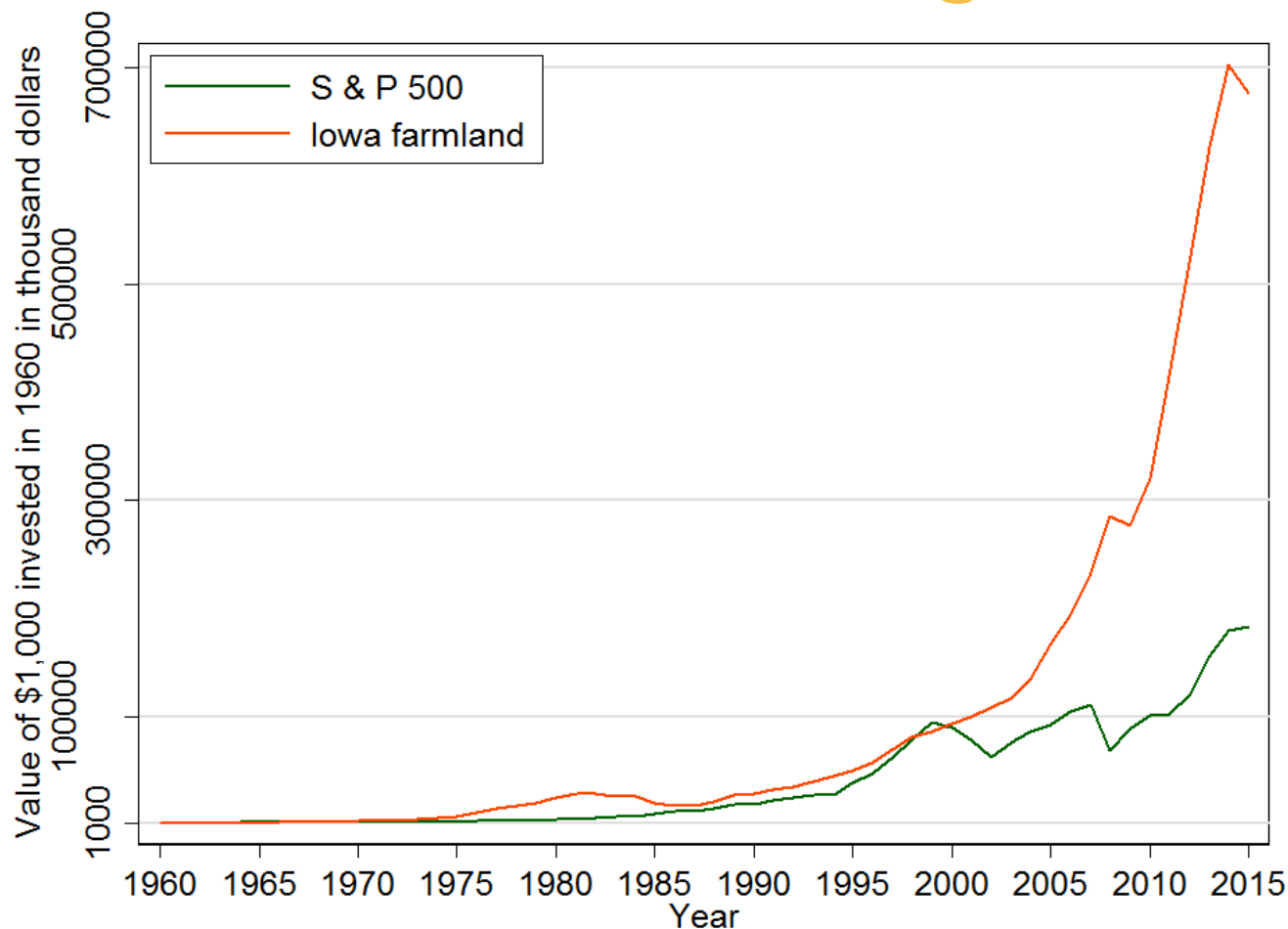
Impact
of Trade
War w
China
and
Mexico

Capitalization Rate (Cap Rate) Rent to Value Ratio



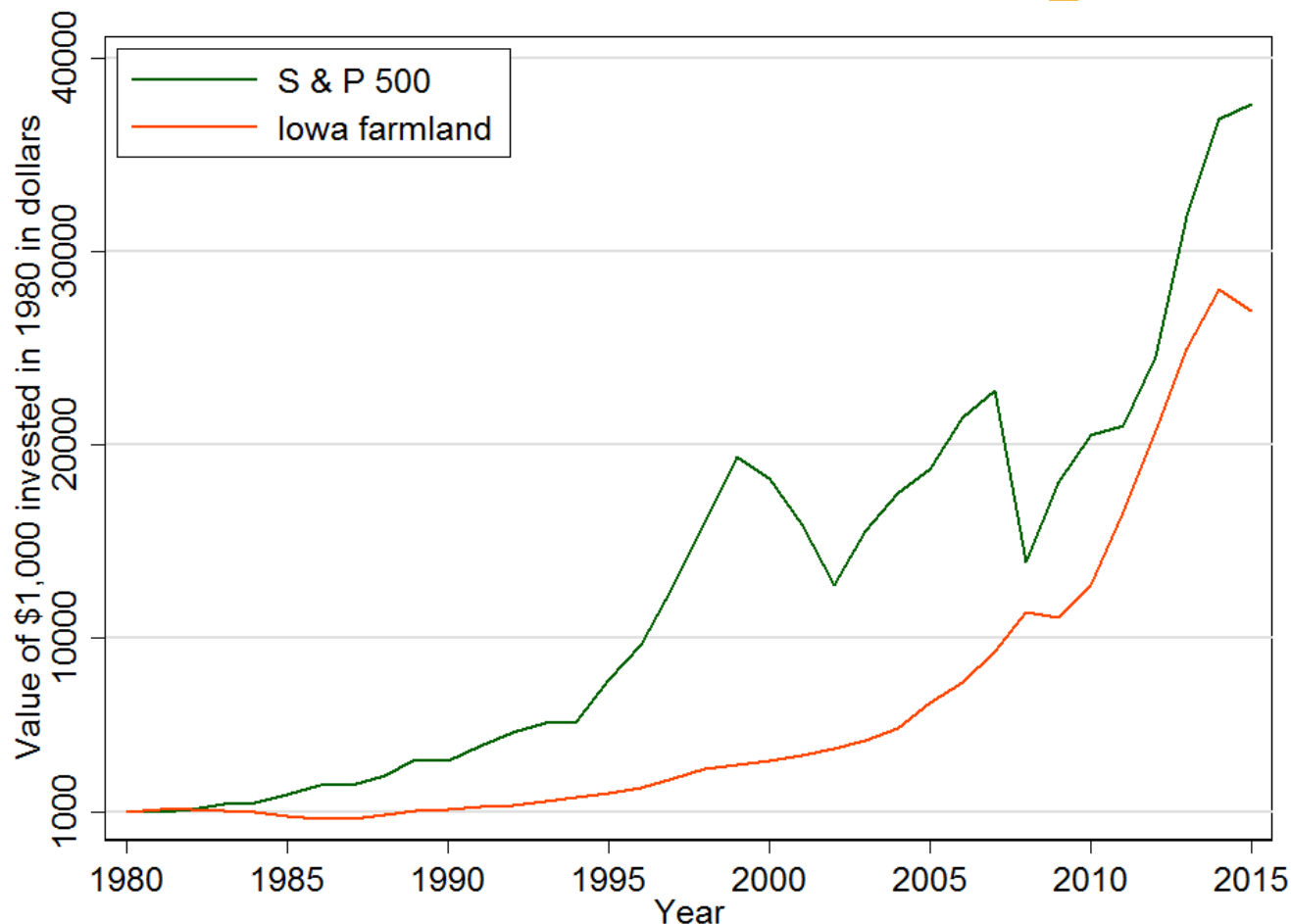
S&P 500 vs. Farmland Values: A Question of Timing

1960



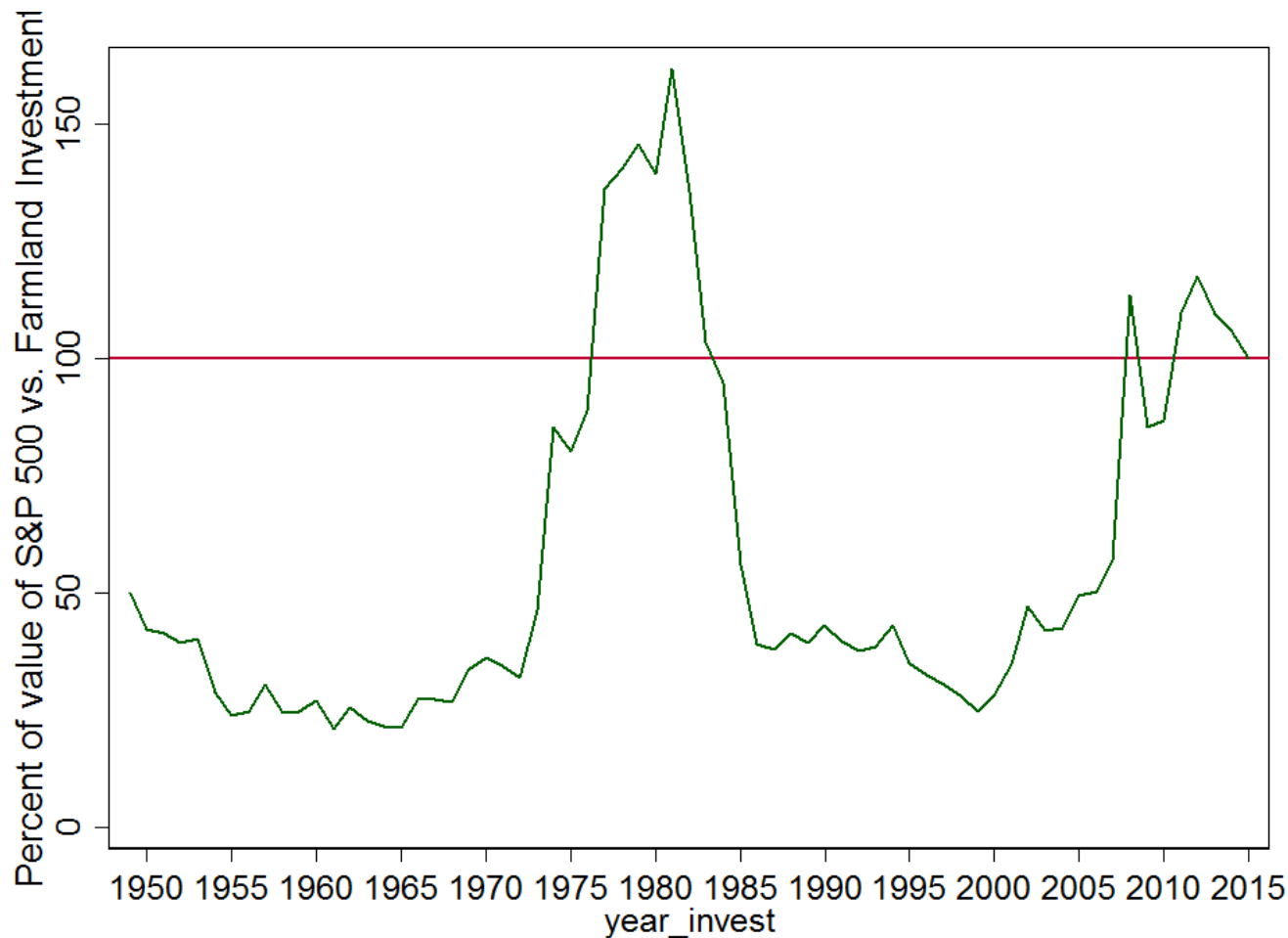
S&P 500 vs. Farmland Values: A Question of Timing

1980



S&P 500 vs. Farmland Values: A Question of Timing 1950-2015

**Return to S & P
Investment Relative
to Iowa Farmland
Investment**



A New, Interactive Iowa Farmland Value Portal

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

Iowa Farmland Value Portal

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



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Iowa Farmland Value Portal ^{BETA}

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

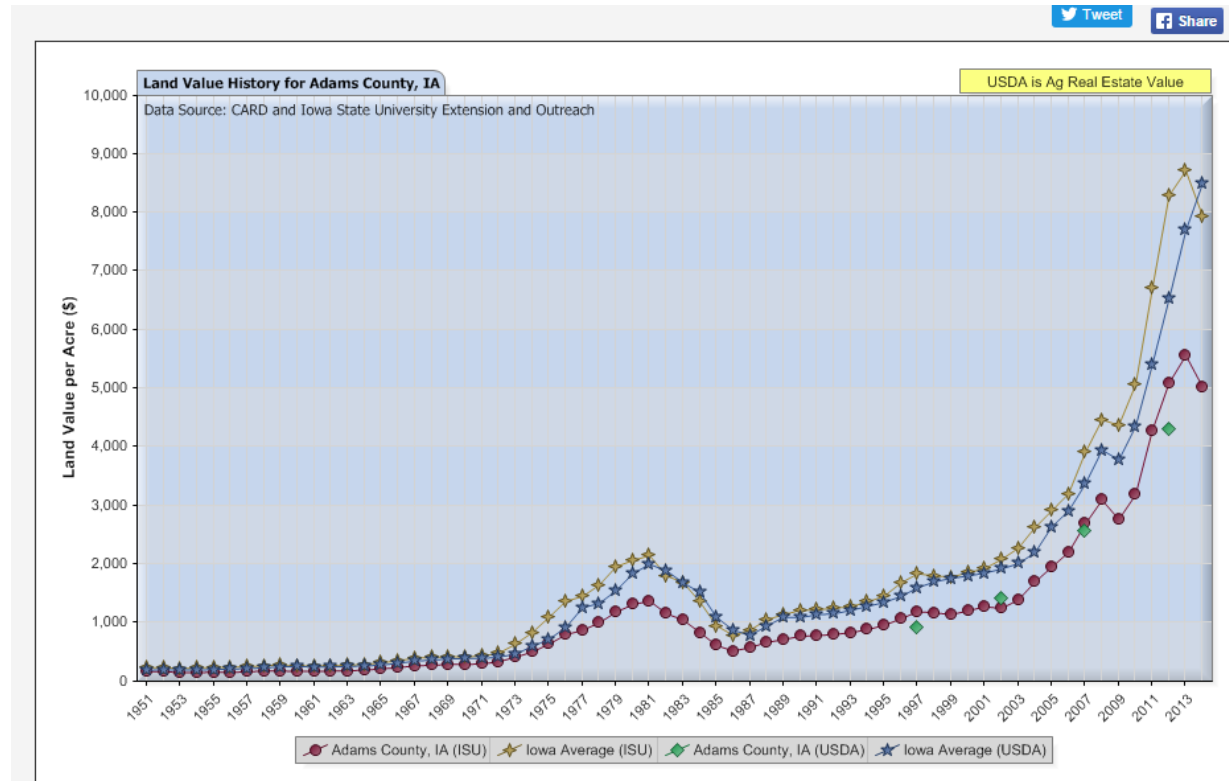
☐ Show Values

☐ Show Iowa Average ☐ Show District Average

Iowa Farmland Value Portal

twitter
#ISUland
value

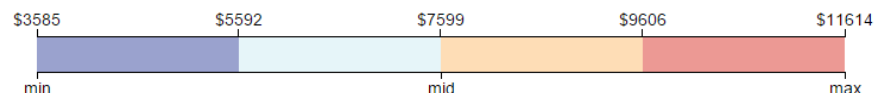
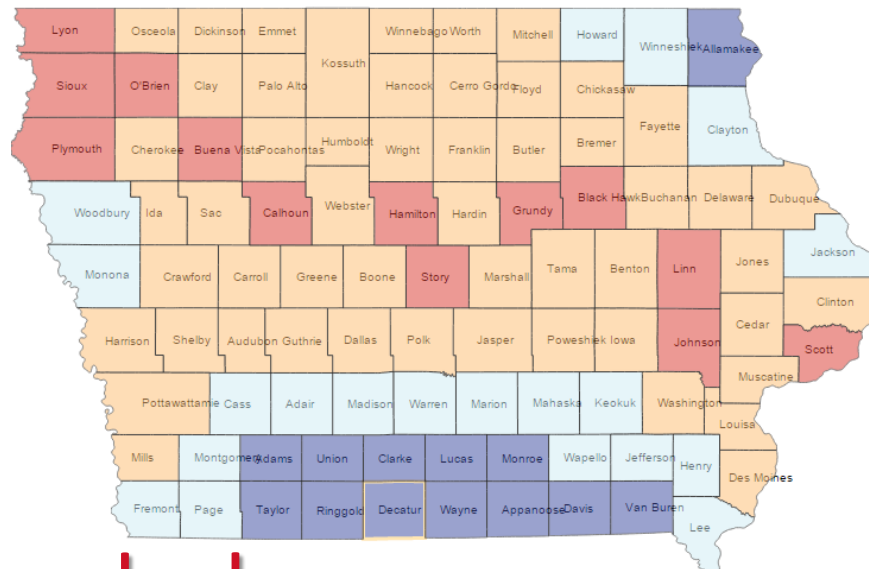
<http://card.iastate.edu/farmland>



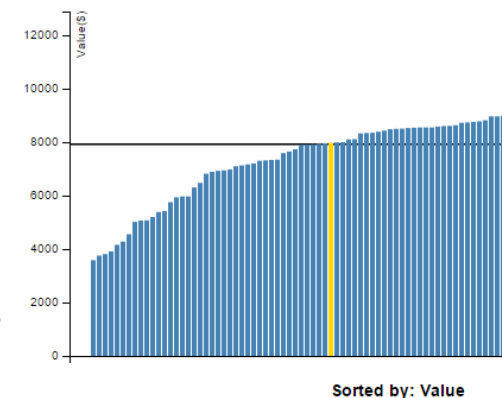
☒ Land Value
 ☐ Value Change(%)
 ☐ Value Change(\$)
☐ Nominal Value
 ☒ Inflation Adjusted

Year:

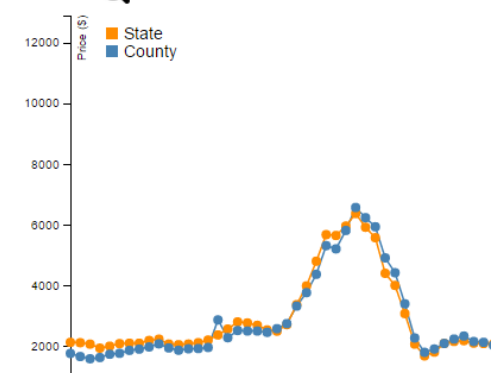
County:



Iowa County Land Value in 2014



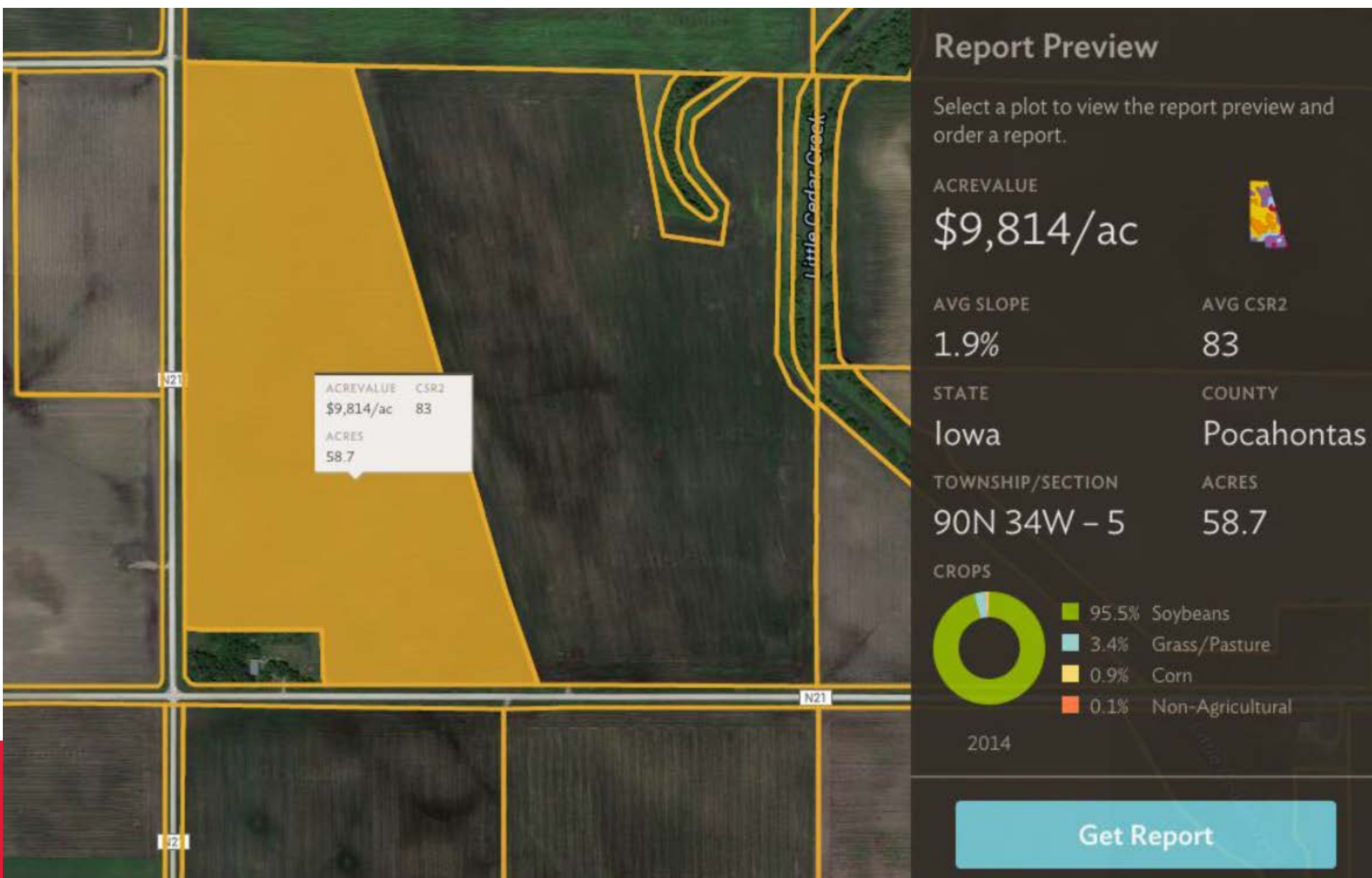
Land Value Trend in County: Dubuque



Iowa Farmland
 Value Portal
www.card.iastate.edu/farmland

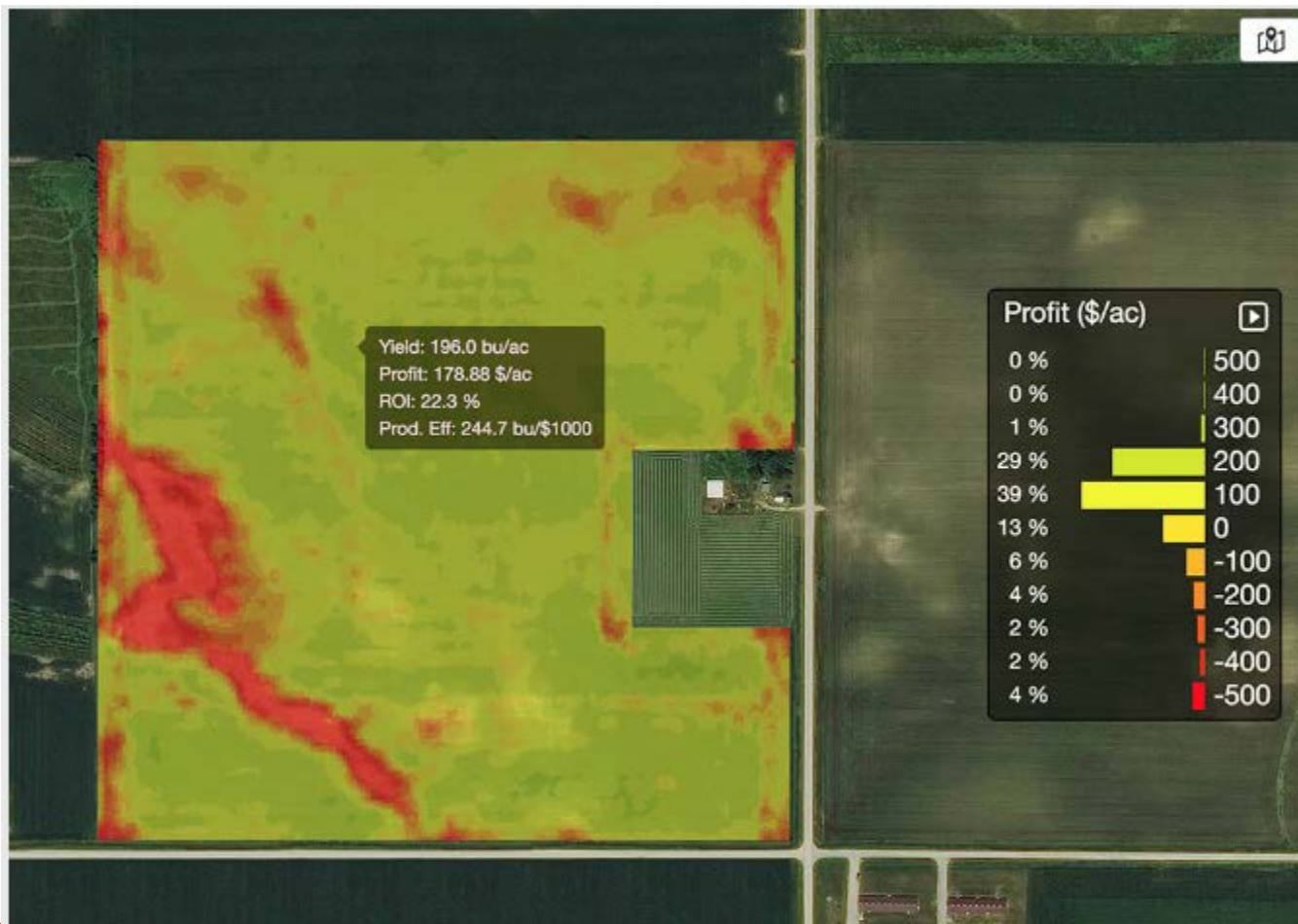
twitter #ISUlandvalue

Zillow for Farmers : Acre Value



WHAT'S MY **FARM WORTH?**

Zillow for Farmers



TERVA

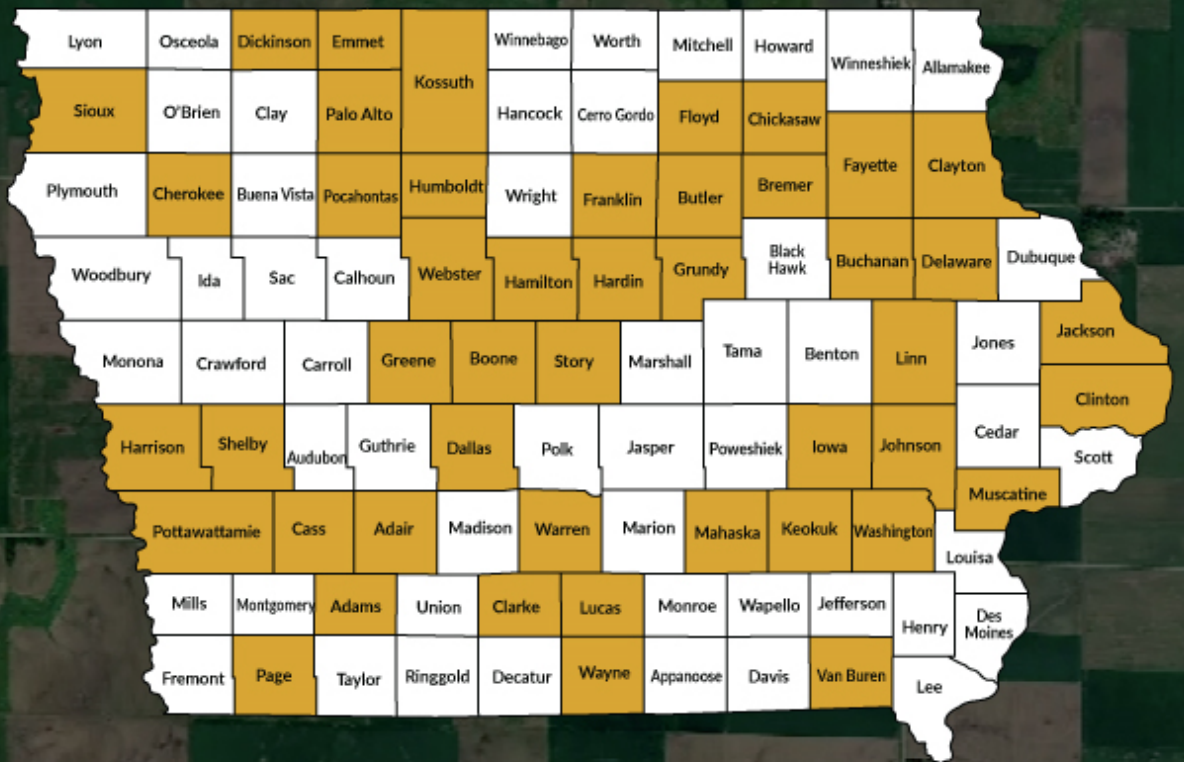
188.63
Osceola Co

TERVA.AG

Find land to farm

terva

Search for land sales



Sold: \$11,281/ac
Total Acres 152.9
CSR2 89

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Thank You!

Wendong Zhang

Assistant Professor and Extension Economist

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