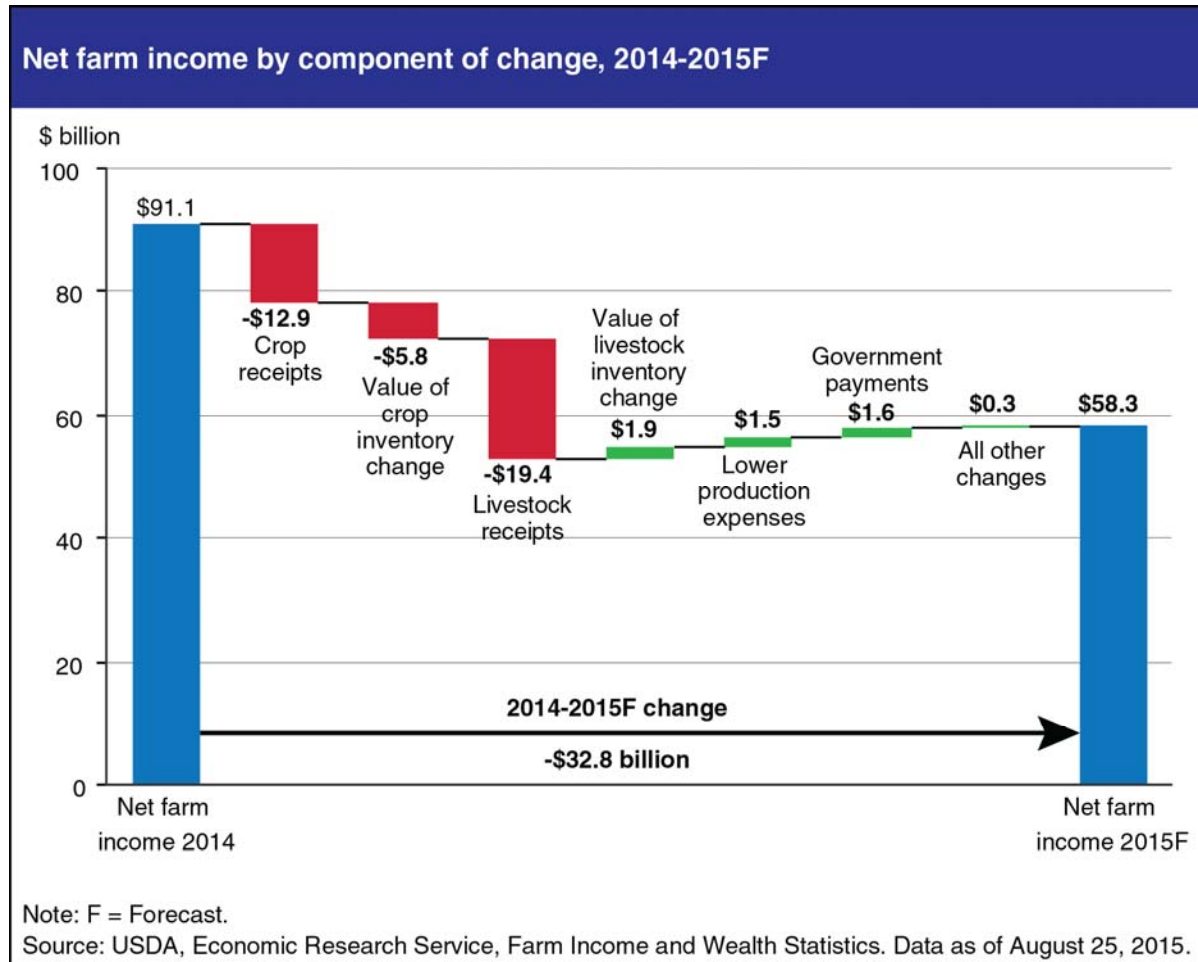




Examining Land Values, Rents, Crop Input Costs & Margins in 2016

Barry Ward

Department of Agricultural, Environmental
and Development Economics,
The Ohio State University

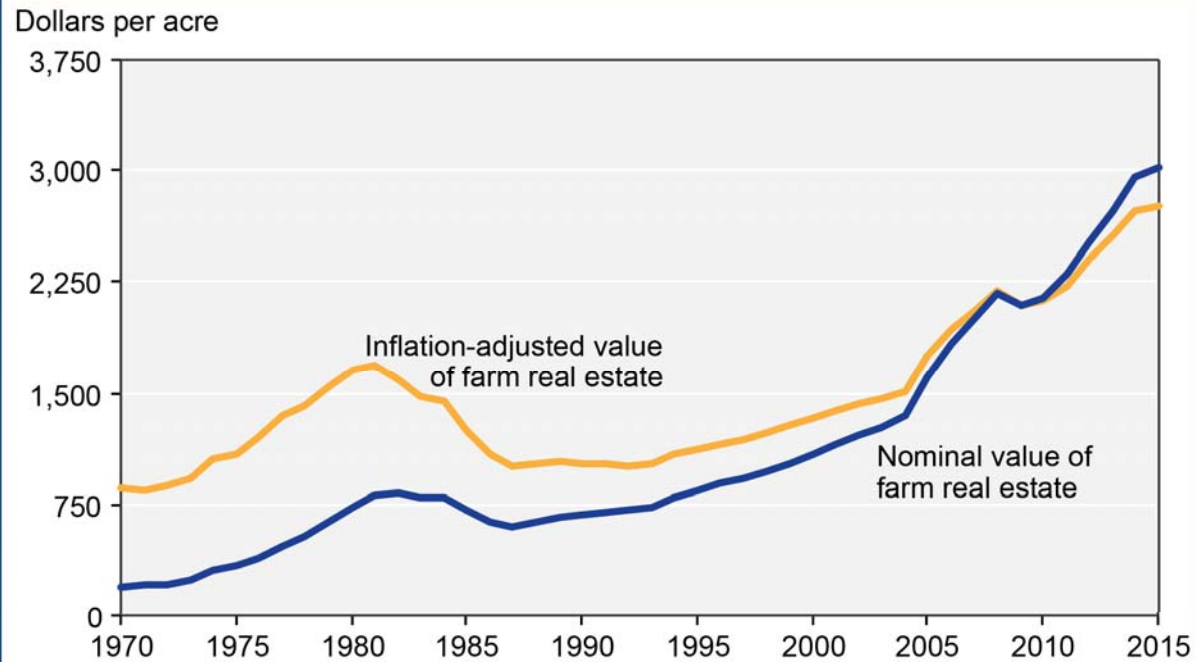


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Average U.S. farm real estate value, nominal and real (inflation adjusted), 1970-2015



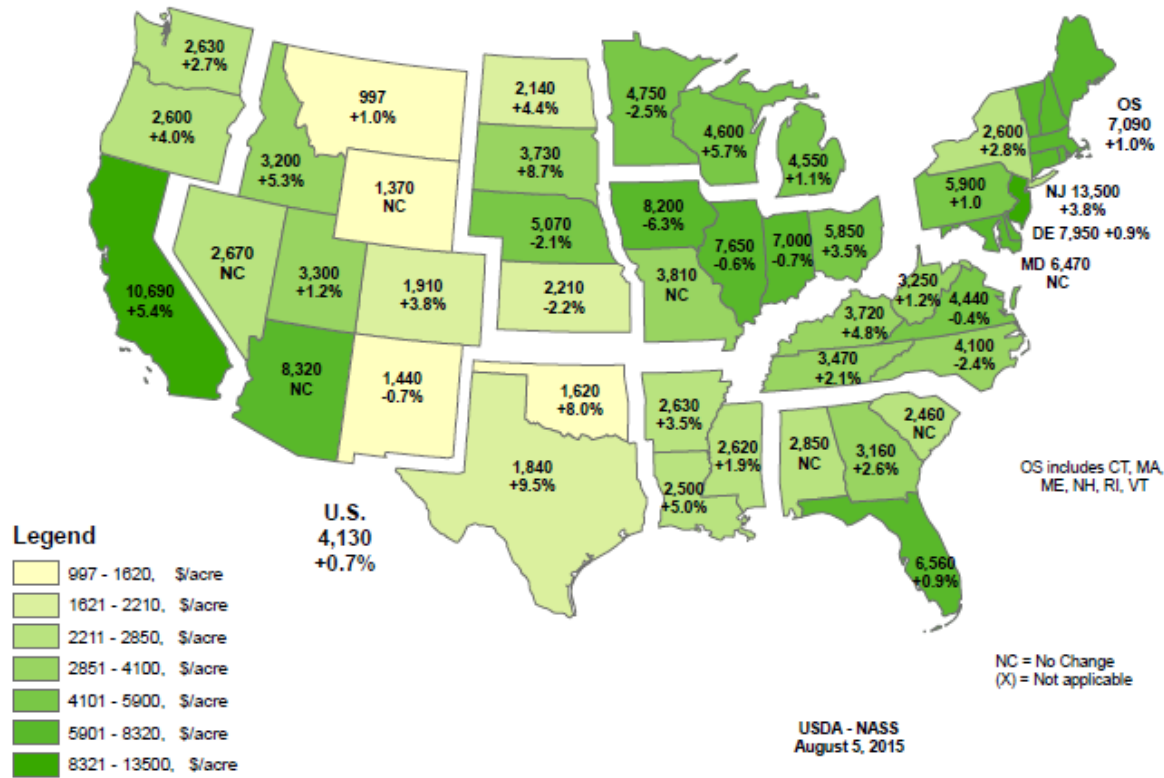
Note: Farm real estate includes land and buildings. Data reflect values as of June 1 of each year. Excludes Alaska and Hawaii. The GDP chain-type price index is used to convert NASS current-dollar statistics to 2009=100 equivalents (Bureau of Economic Analysis, Department of Commerce).

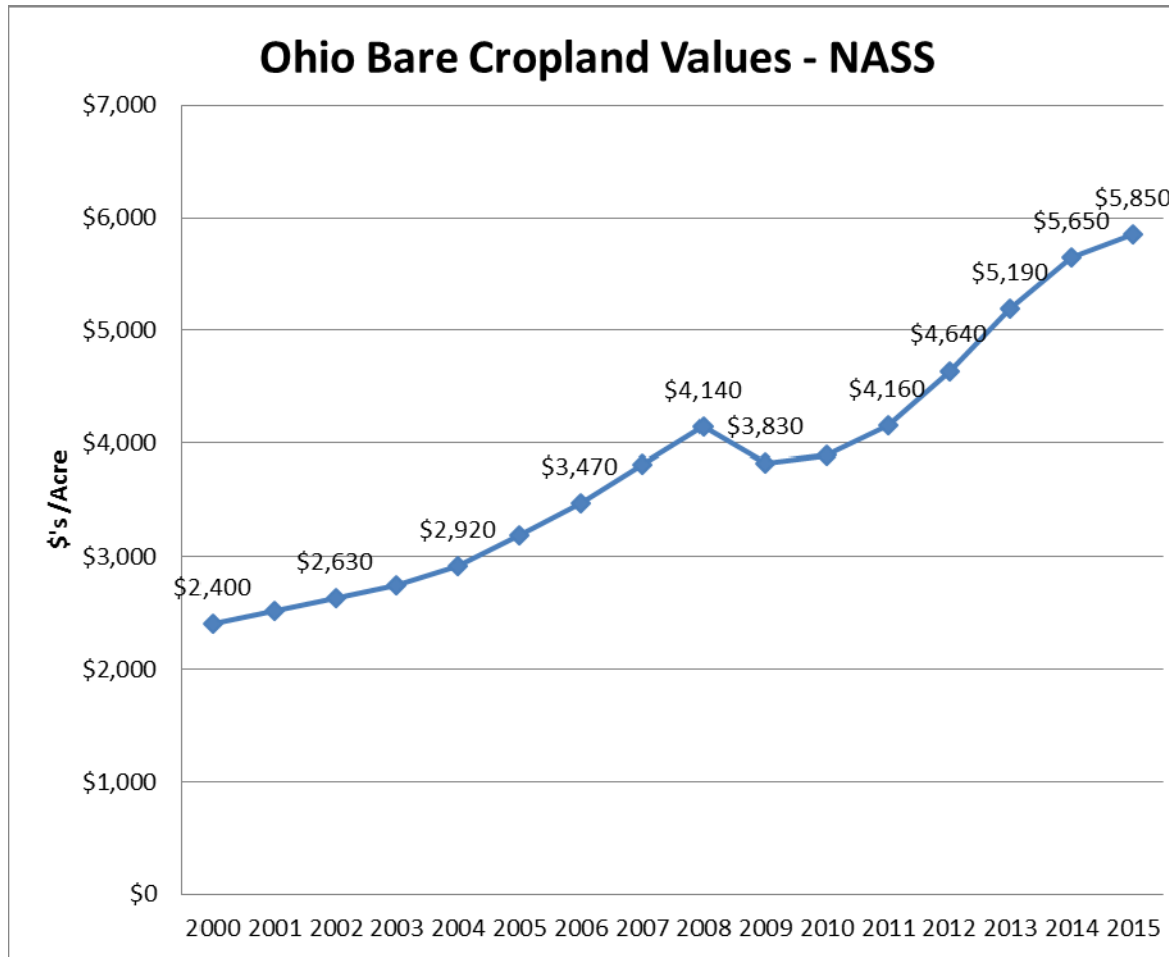
Source: USDA, Economic Research Service and National Agricultural Statistics Service.



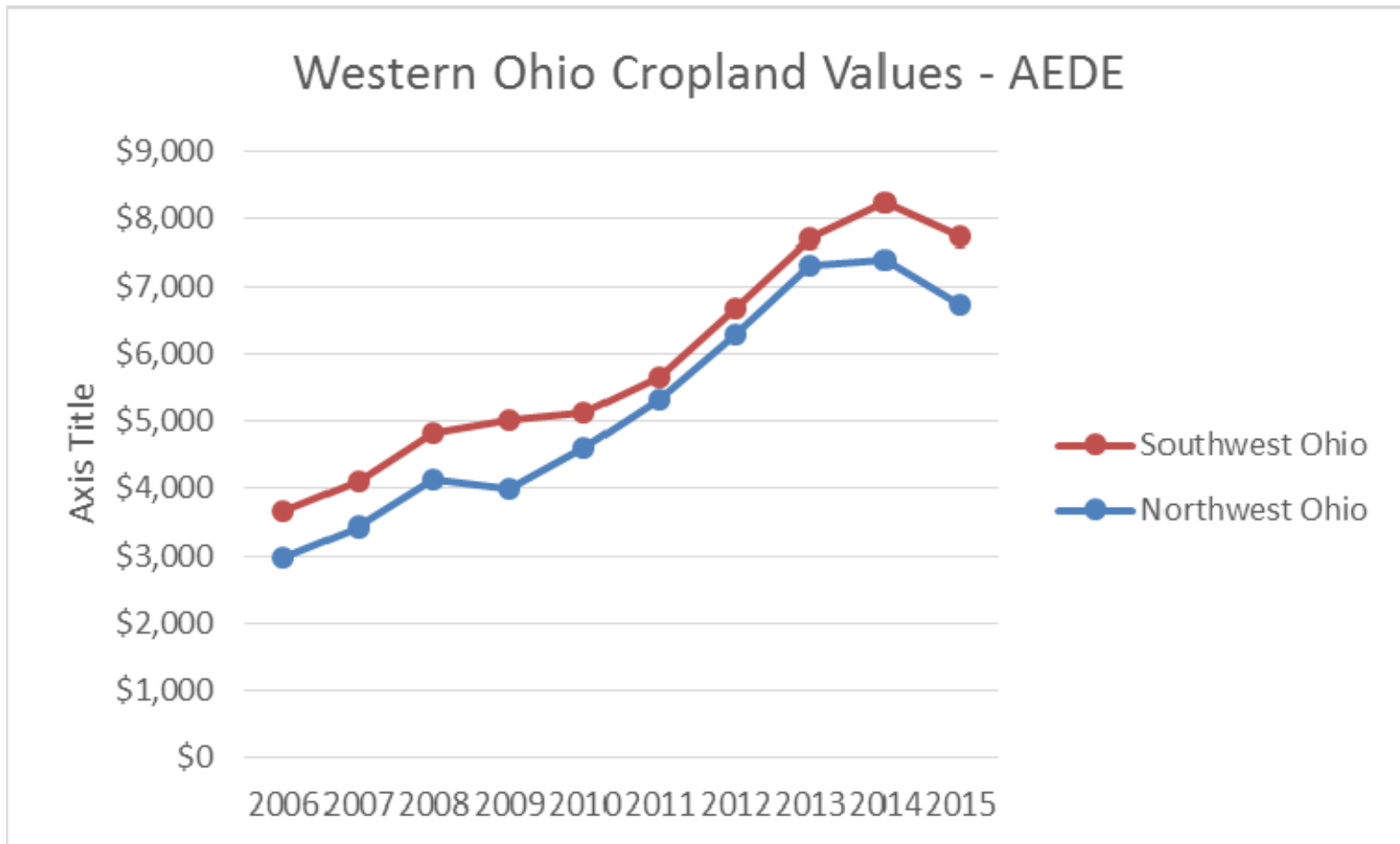
2015 Cropland Value by State

Dollars per Acre and Percent Change from 2014





Source: NASS





Land Survey Data - % Changes

OSU AEDE (collected Jan-Mar 2015)

2014-2015 T -5.5%, A -7.2%, P -9.5%

Purdue (Indiana) (collected June 2015)

June 14-June 15 T -5.1%, A -3.8%, P -4.8%

Dec 14 – June15 T -4.4%, A -4.1%, P -7.0%

Chicago Fed (Collected July 1, 2015)

Indiana - Northern 3/4 – “Good” Farmland

Yearly July14–July15 +4% (District 7, -3%)

2nd Qtr. Change +2% (District 7, -1%)

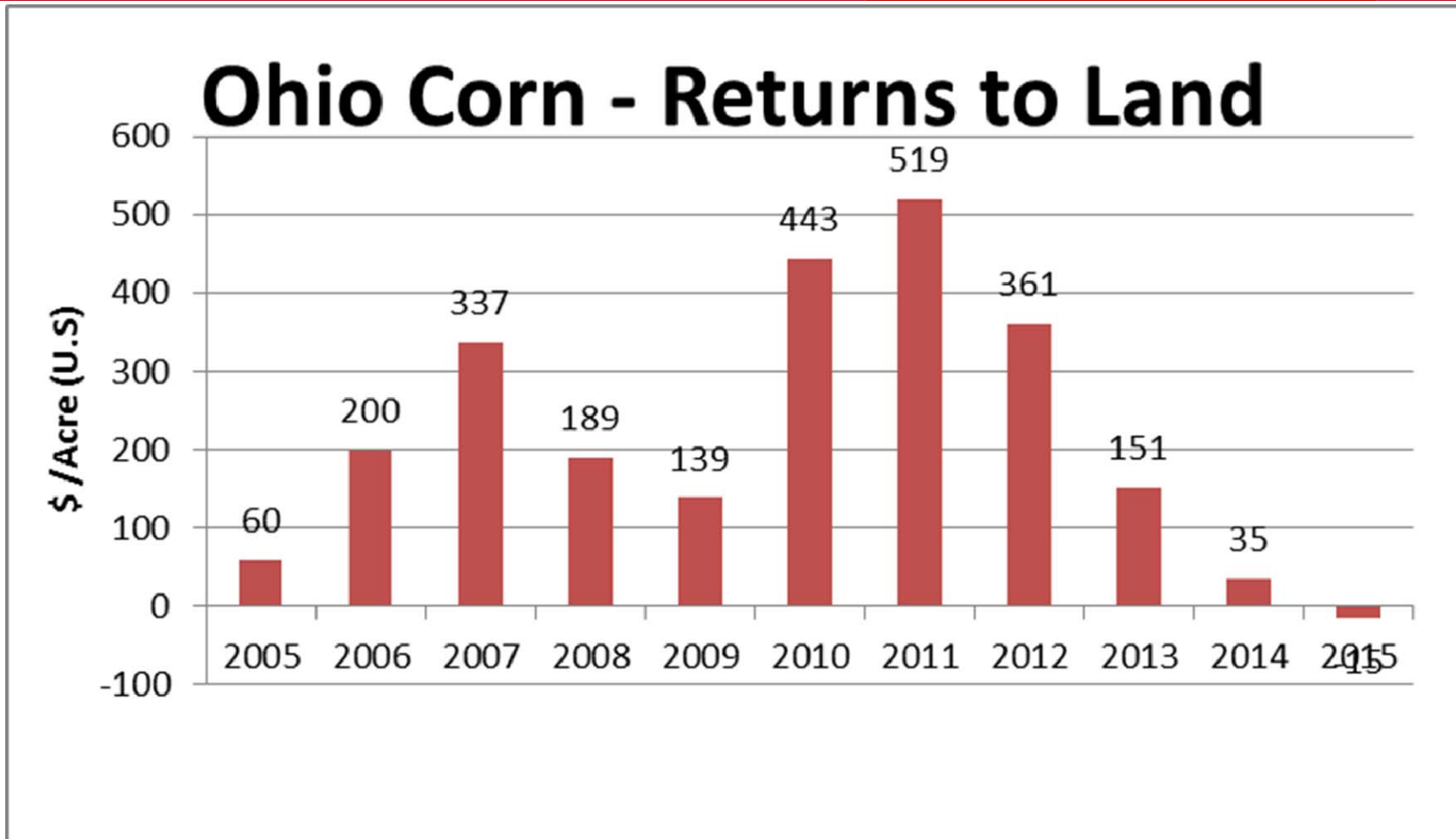


What has Driven Land Value?

- >> Crop Net Income – good to excellent '06-'13
 - lower in '14,'15 and likely '16

- >> Low interest rates – 10 Year T-Bill ~ 2.2%

- >> Farmer's (crop) equity still solid but will likely decrease again in 2016
 - U.S. Farms (USDA) Debt to Asset (D/A) Ratio ~ 13%
(Down from 14.7% in 2002...up from the low of 11.25% in 2012)
 - Grain Farms (Illinois FBFM) D/A Ratio (Median) ~ 18.4%
(Down from 30.7% in 2002, 27.4% in 2005, up from 18.0% in 2012)



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U.S. Treasuries – 10 Year T- Bills



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Interest Rates

- >>Geopolitical Risk
- >>Sluggish World Economy
 - >>Foreign Demand for Treasuries
- >>Full employment (5.0% Unemployment),
stronger economic growth

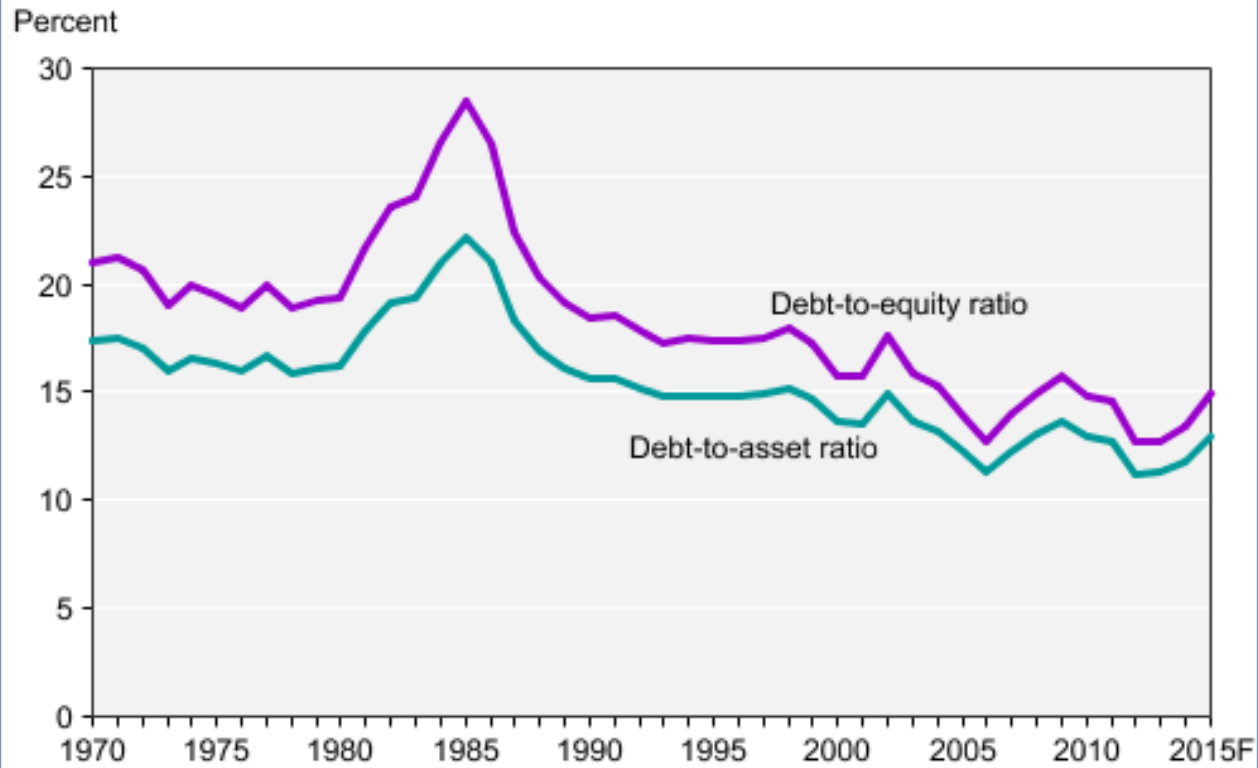


Credit Conditions at Seventh District Agricultural Banks

	Loan Demand Index	Funds Availability Index	Loan Repayment Rates Index	Avg. Loan - Dep. Ratio percent	Interest Rates on Farm Loans		
					Operating Loans percent	Feeder Cattle percent	Real Estate percent
2014							
Jan–Mar	114	128	96	67	4.93	5.07	4.66
Apr–June	110	123	93	67.3	4.86	4.98	4.67
July–Sept	123	106	85	69.5	4.89	5.01	4.62
Oct–Dec	137	109	69	70.6	4.87	5.03	4.61
2015							
Jan–Mar	141	105	57	69	4.8	4.95	4.57
Apr–June	140	102	64	72.1	4.81	4.97	4.64
July–Sept	125	105	60	72.3	4.82	4.96	4.58



Farm sector solvency ratios, 1970-2015F



Note: F = forecast.
Source: USDA, Economic Research Service, Farm Income and Wealth Statistics.
Data as of August 25, 2015.



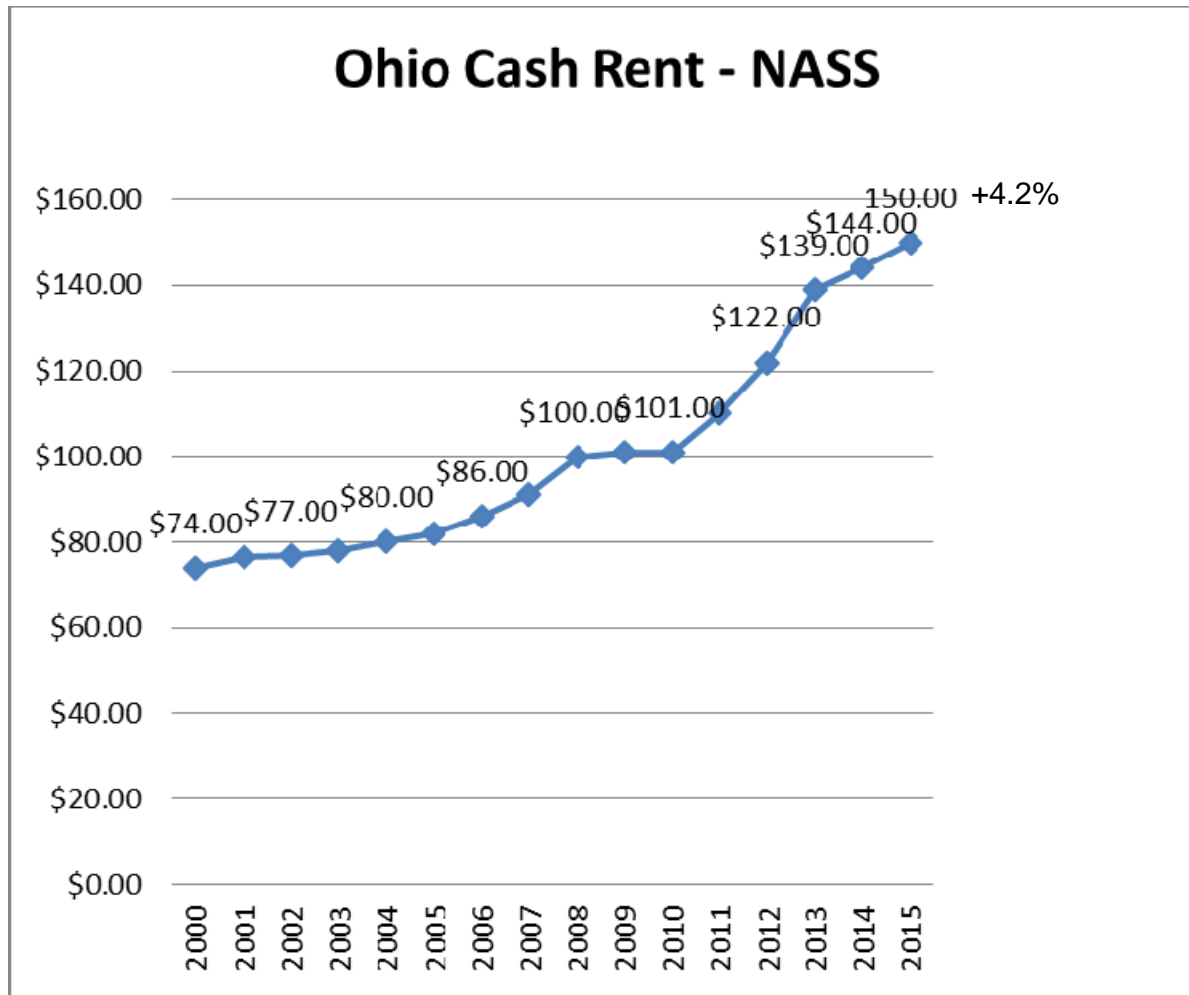
Farmland Values: Outlook

Competing Fundamentals:

- Crop Net Income will be lower or negative
- Higher Interest Rates likely.....

versus

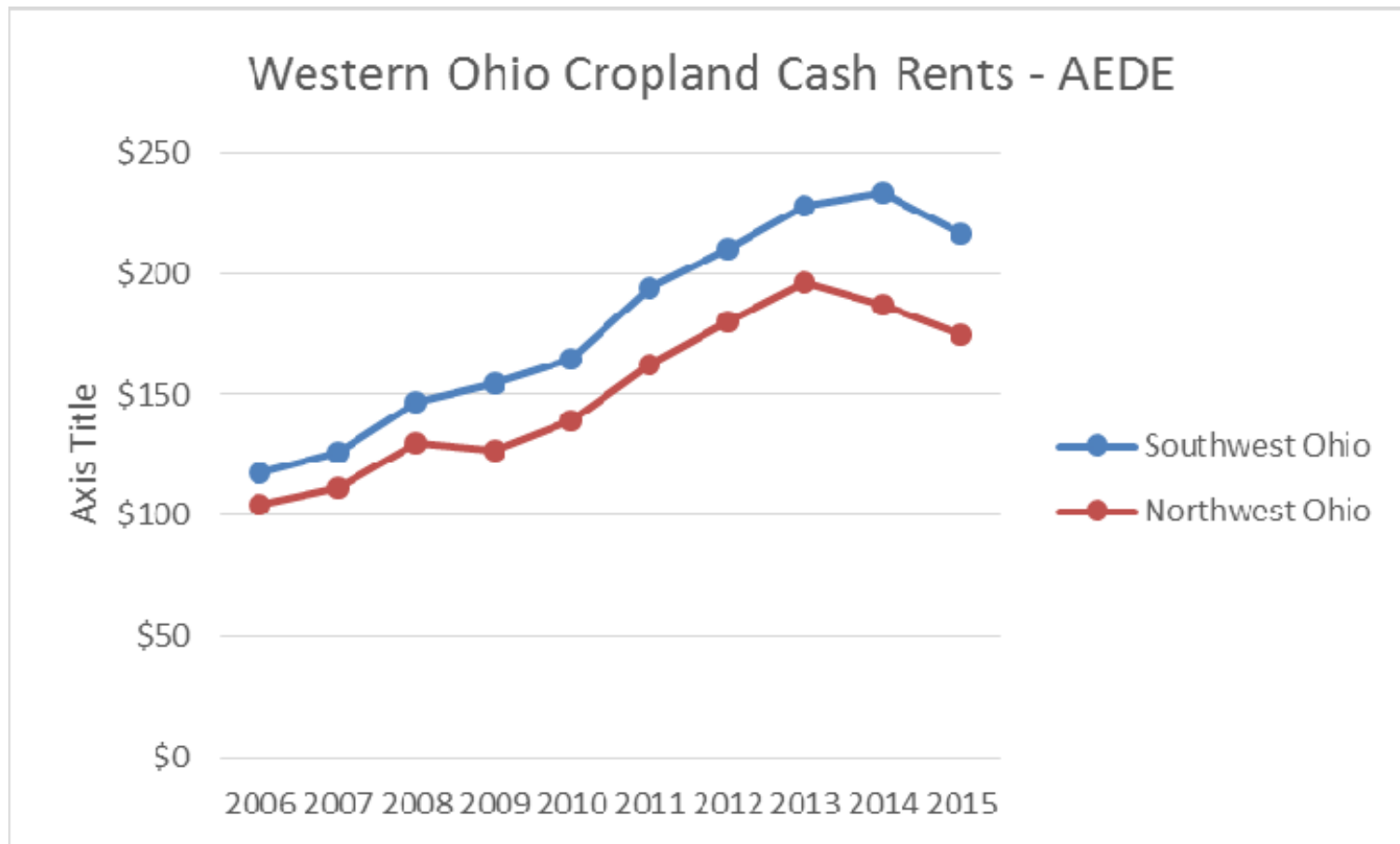
- Farmer equity positions are healthy but weakening
- Livestock/Dairy income mixed





What has Driven Rental Rates?

- >Crop Net Income has been good
- >Farmers balance sheets strengthened
 - + Larger pool of tenants
 - + Rental bids highly competitive – tenants understand that once land is leased there is a greater likelihood of retaining the land – transaction costs to the landowner to change tenants
- >Property tax increases
- >High profit years with favorable tax provisions have in some cases led to excess machinery capacity





Land Rental Survey Data - % Changes

OSU AEDE (collected Jan-Mar 2015)

2014-2015 T -7.6%, A -6.9%, P -7.9%

Purdue (Indiana) (collected June 2015)

June 14-June 15 T -2.4%, A -1.3%, P -2.2%

Chicago Fed (Collected July 1, 2015)

Indiana (Northern $\frac{3}{4}$) – “Good” Farmland

Yearly July14–July15 -6% (District 7, -9%)

Michigan “Good” Farmland

Yearly July14–July15 +1%



Rental Rates: Outlook

Competing Fundamentals:

Crop Net Income will be lower

Balance sheets weakening generally

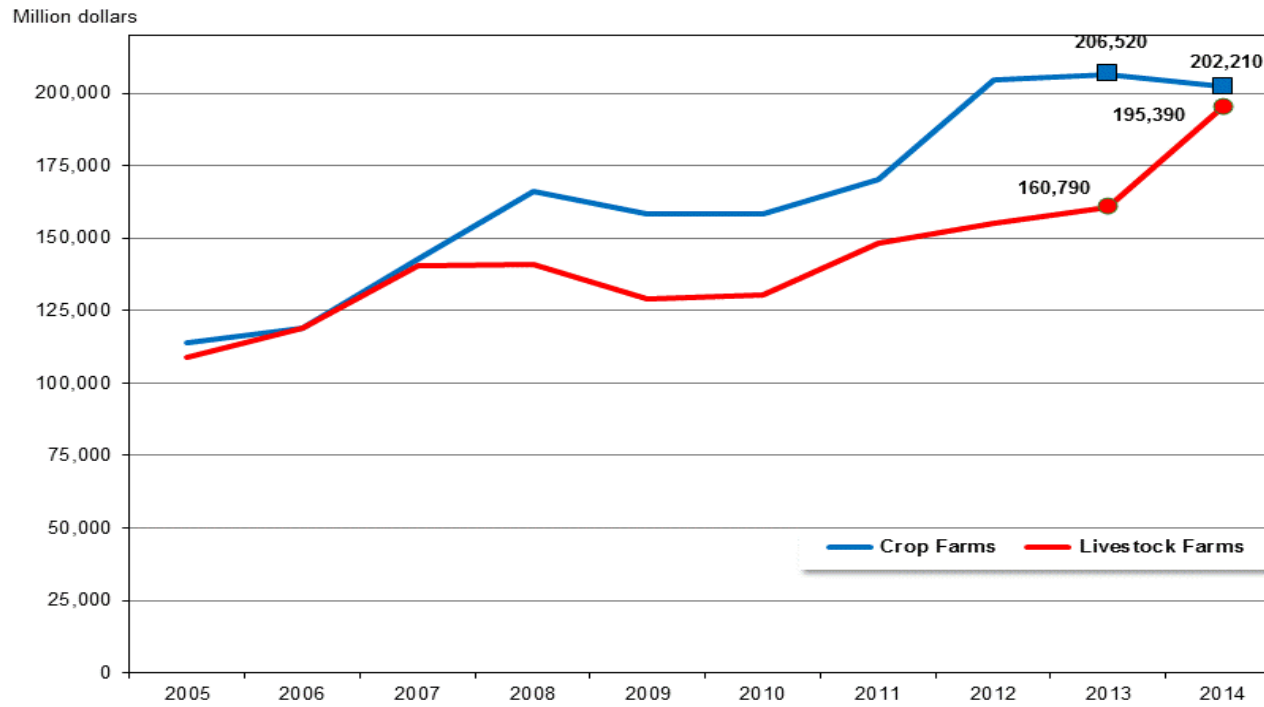
versus

Farm balance sheets are still healthy in a historical context

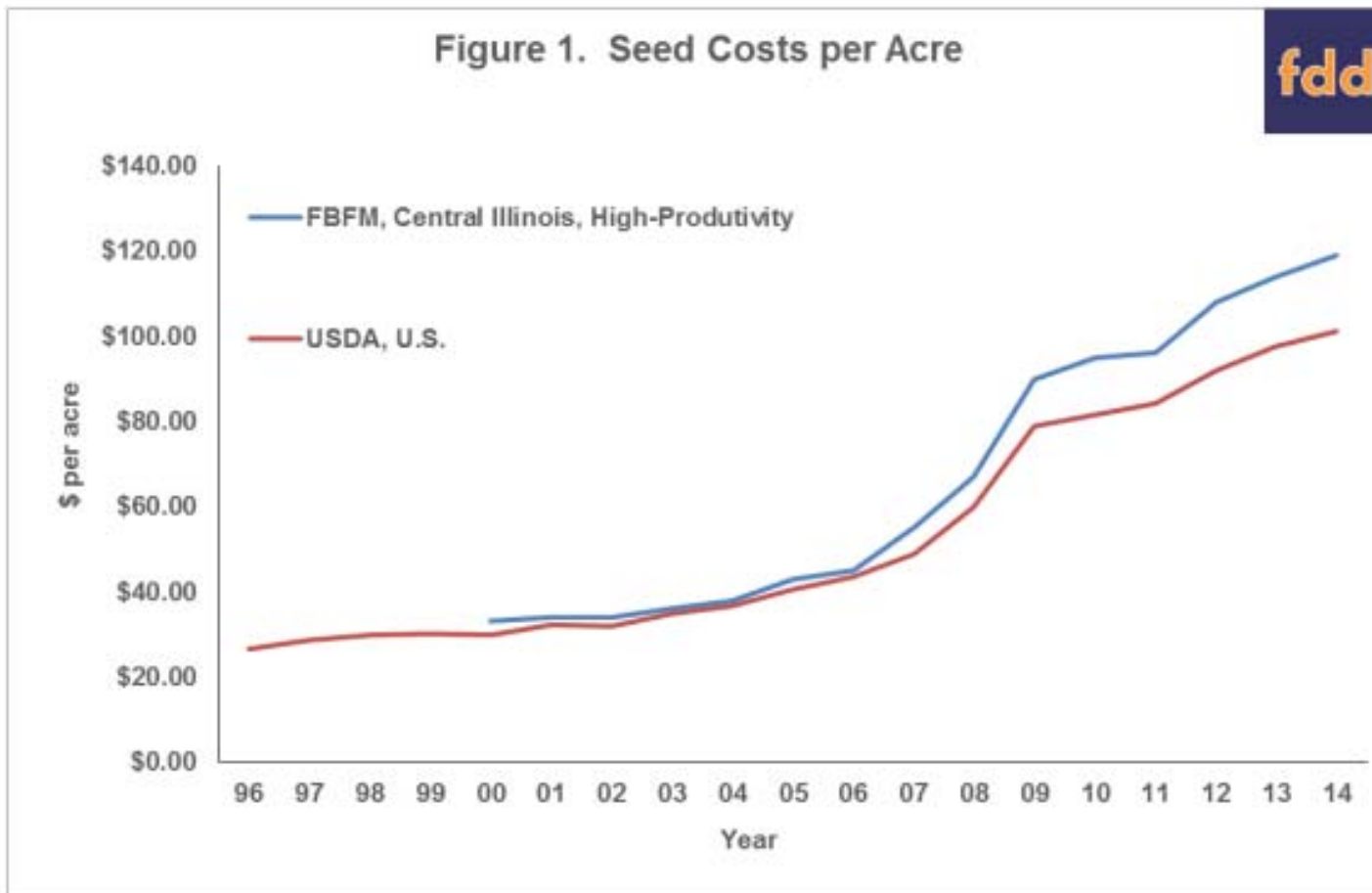
Higher property taxes



Crop and Livestock Total Production Expenditures,
by Year – United States: 2005-2014

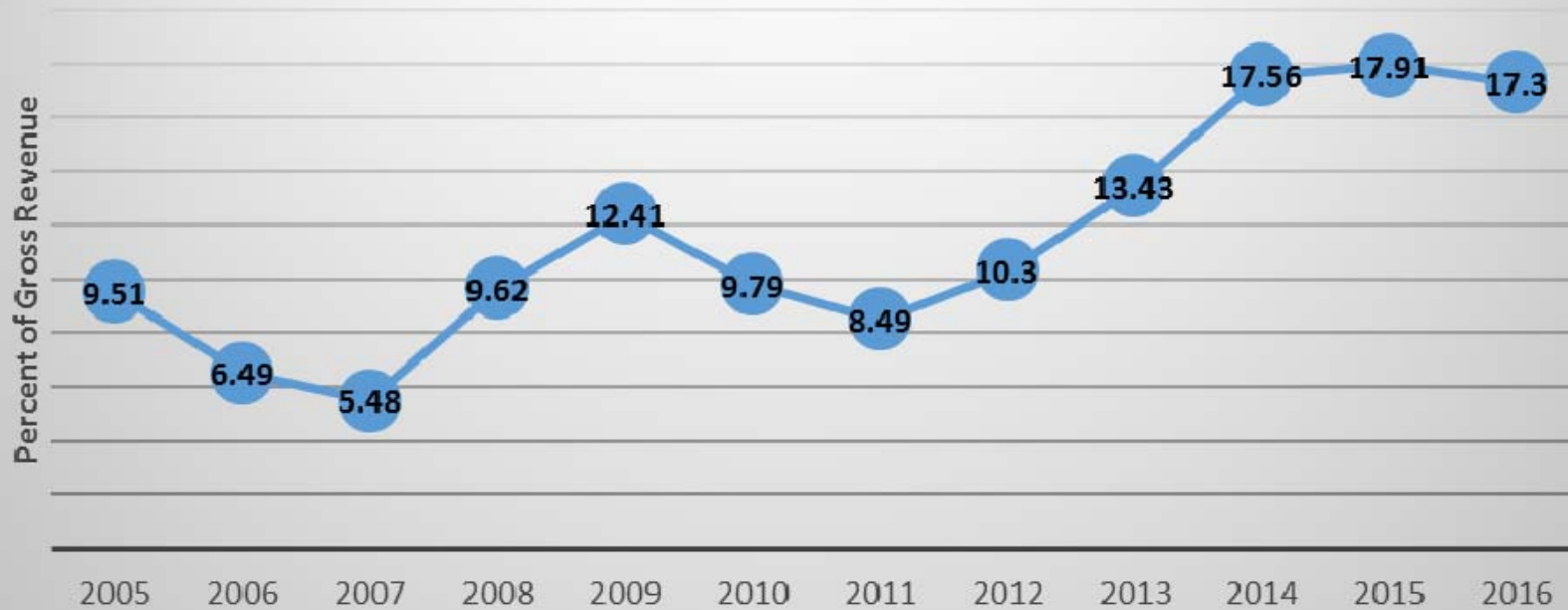


USDA NASS – August 2015

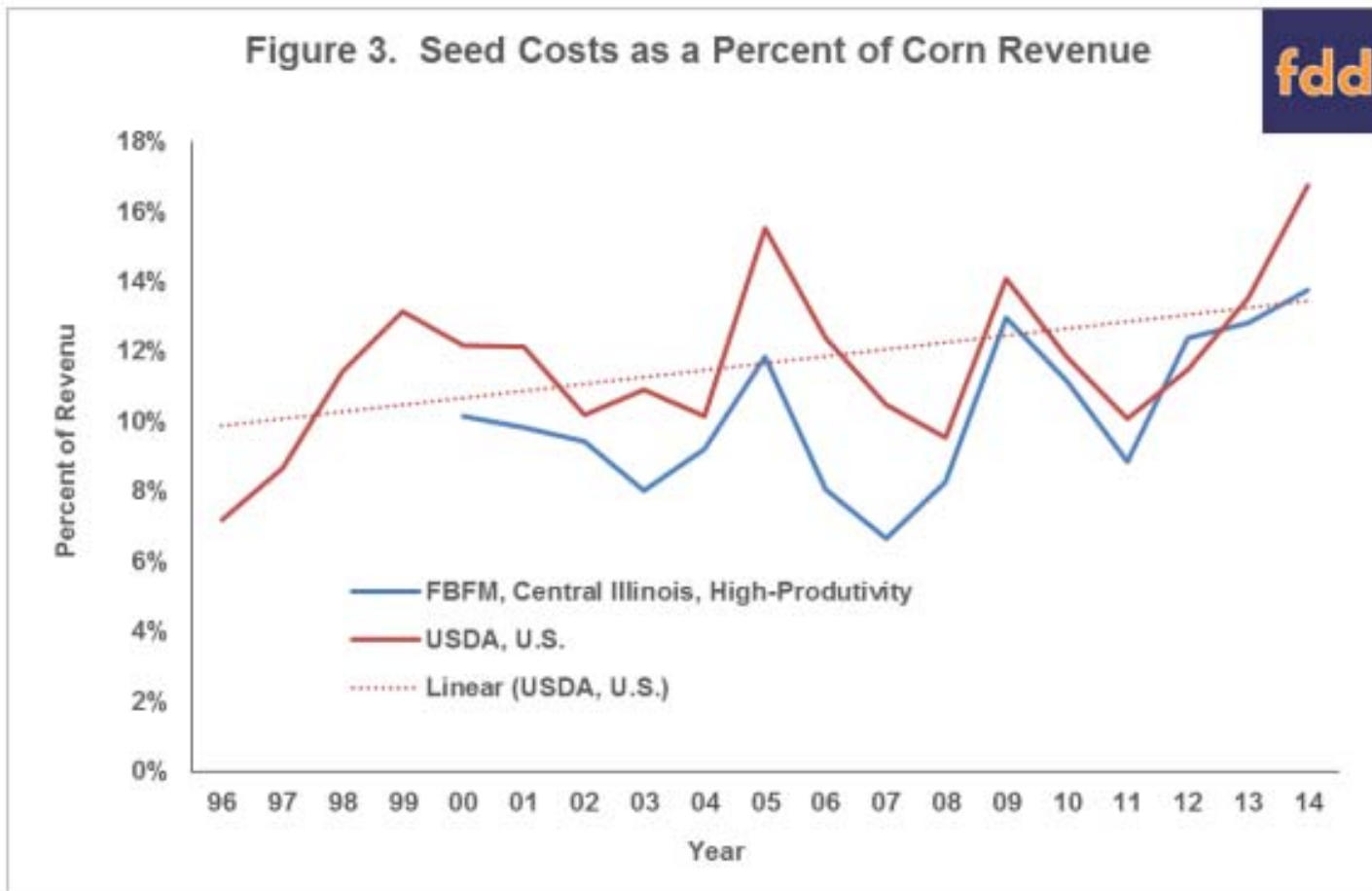




Seed Cost* as a Percent of Gross Revenue Corn - Ohio



*Source - Ohio Enterprise Budgets - Corn Production Budgets





Energy Outlook

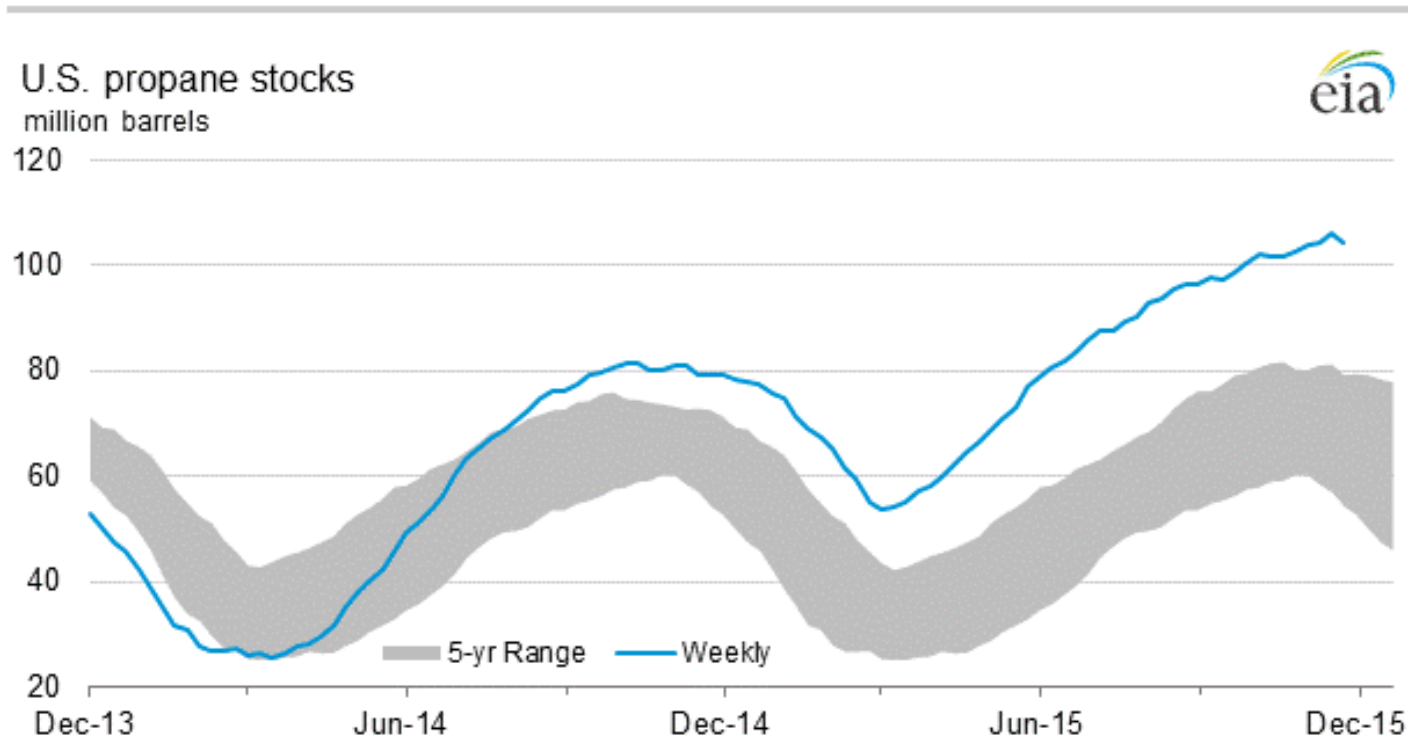
November 2015 Estimates EIA

	2014	2015	2016	'13-'14	'14-'15	'15-'16
WTI Crude (\$/bbl)	93.17	49.88	51.31	-4.8%	-46.5%	2.9%
Brent Crude (\$/bbl)	98.89	53.82	56.24	-9.0%	-45.6%	4.5%
Gasoline (\$/gal)	3.36	2.43	2.33	-4.3%	-27.7%	-4.1%
Diesel (\$/gal)	3.83	2.72	2.70	-2.3%	-29.0%	-0.7%
Nat. Gas (\$/mcf)	10.94	10.24	10.09	6.2%	-6.4%	-1.5%



Propane Stocks

December 2015 Estimates EIA



Source: U.S. Energy Information Administration

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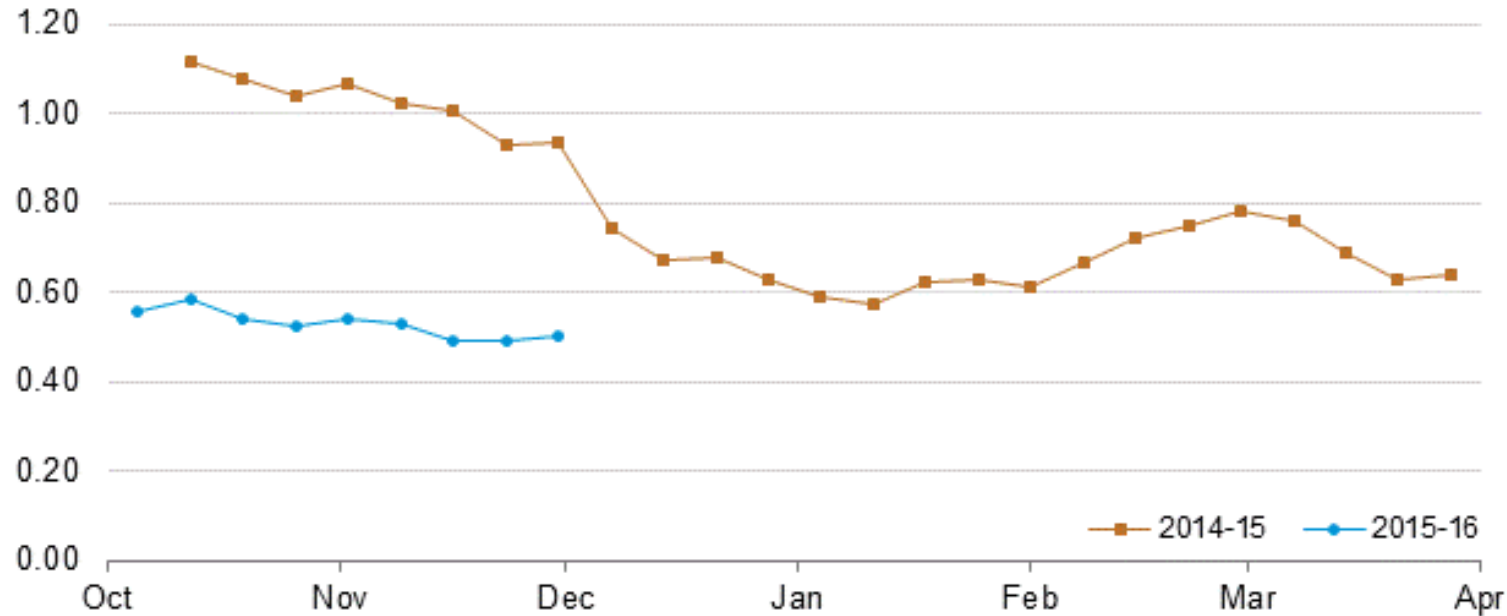
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Propane Wholesale Price

December 2015 Estimates EIA

U.S. average wholesale propane
dollars/gallon



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Current Ohio Fertilizer Prices

NH3	\$650 (\$625-695) -13%
UAN(28%)	\$286 (\$270-295) -11%
MAP	\$540 (\$515-580) -8.5%
Potash	\$390 (\$375-410) -19%

Source: DTN Fertilizer Index



Nitrogen - Greenfield Developments

Ohio Valley Resources - Spencer County, IN	1,200,000,000
Midwest Fertilizer Co. - Mt. Vernon, IN	2,600,000,000
Cronus Chemical - Tuscola, IL	1,500,000,000
OCI Iowa Fertilizer - Wever, IA	1,800,000,000
CHS Inc. - Spiritwood, ND	3,000,000,000
Northern Plains Nit. - Grand Forks, ND	1,850,000,000
Magnida Nitrogen Idaho - American Falls, ID	1,500,000,000
AM Agrigen Nitrogen - Kilona, LA	1,200,000,000
Yara Int. & BASF Group, Freeport, Texas	600,000,000
Euro Chem, Iberville LA	



Nitrogen - Brownfield Developments

CF Industries - Port Neal, IA	1,900,000,000
CF Industries - Donaldsonville, LA	2,300,000,000
Rentech Nitrogen - East Debuque, IL	80,000,000
LSB Industries - El Dorado, AR	500,000,000
JR Simplot - Rock Springs, WY	350,000,000
Koch Nitrogen Co. - Enid, OK	1,300,000,000
OCI Nitrogen - Beaumont, TX	245,000,000
Agrium - Borger, TX	720,000,000
PCS-Lima, Ohio	210,000,000



Crop Input Costs

Energy – Lower

Fertilizer – Lower

Seed – Flat to Modestly Lower

Chemical – Modestly Lower to Modestly
Higher Depending on the Product

Machinery/Equipment Depreciation - Higher



THE OHIO STATE UNIVERSITY COLLEGE OF FOOD, AGRICULTURAL, AND ENVIRONMENTAL SCIENCES		CORN PRODUCTION BUDGET-2016						
		Conservation Tillage Practices: N-Source - NH3						
		Reflects 2000 acres, Conservation Tillage Corn/No-Till RR Soybeans						
		Updated:					10/23/2015	
ITEM	EXPLANATION	YOUR PROD. NUMBERS	PRICE PER UNIT	YIELD (bu/A) ¹			YOUR BUDGET	
				131	163	196	210	
RECEIPTS								
Com ¹			\$3.80 /bu	496.28	620.16	744.04	798.00	
ARG/PLC Payment ²				32.00	32.00	32.00	32.00	
Crop Insurance Indemnity				0.00	0.00	0.00	0.00	
Grower or Market Premium				0.00	0.00	0.00	0.00	
TOTAL RECEIPTS				528.28	652.16	776.04	830.00	
VARIABLE COSTS								
Seed (kernels) ³	28000 32000 34000 34000		\$3.44 /1000	96.25	110.00	116.88	116.88	
	Seed Cost Per Bag		\$275.00 /bag					
Fertilizer ⁴								
Starter Fertilizer				0.00	0.00	0.00	0.00	
N (lbs.)	120.6 165.0 209.3	228.6	0.418 /lb	60.38	78.90	97.42	105.48	
P ₂ O ₅ (lbs)	48.3 60.4 72.4	77.7	0.5288 /lb	25.55	31.93	38.31	41.09	
K ₂ O(lbs)	35.3 44.1 52.9	56.7	0.3375 /lb	11.90	14.87	17.84	19.14	
Lime(ton)	0.25	0.25	25 /ton	6.25	6.25	6.25	6.25	
Chemicals ⁵	Herbicide			56.08	56.08	56.08	56.08	
	Fungicide			0.00	0.00	0.00	0.00	
	Insecticide			0.00	0.00	0.00	0.00	
Drying - Fuel & Electric only ⁶	\$0.75 /gal LP		0.09 /bu	11.10	13.87	16.64	17.85	
Trucking - Fuel Only ⁷	\$2.75 /gal Diesel		30 miles	2.19	2.74	3.29	3.53	
Fuel, Oil, Grease ⁸				12.95	12.95	12.95	12.95	
Repairs ⁹				26.78	26.78	26.78	26.78	
Crop Insurance ¹⁰				16.30	17.00	17.80	17.80	
Miscellaneous ¹¹				5.00	5.00	5.00	5.00	
Inf. on Oper. Cap. ¹²	7 mo.		5.00%	9.26	10.49	11.53	11.88	
Hired Labor ¹³				0.00	0.00	0.00	0.00	
TOTAL VARIABLE COSTS		-Per Acre		340.00	386.87	426.77	440.70	
		-Per Bushel		2.60	2.37	2.18	2.10	
FIXED COSTS								
Labor Charge ¹³	3 hours		15.00 /hr	45.00	45.00	45.00	45.00	
Management Charge ¹⁴	5% of gross revenue			26.41	32.61	38.80	41.50	
Mach. And Equip. Charge ¹⁵				130.45	130.45	130.45	130.45	
Land Charge ¹⁶	Rent			147.00	199.00	259.00	259.00	
Miscellaneous ¹¹				24.00	24.00	24.00	24.00	
TOTAL FIXED COSTS				372.86	431.05	497.25	499.95	
TOTAL COSTS		-Per Acre		712.86	817.92	924.01	940.65	
		-Per Bushel		5.46	5.01	4.72	4.48	
RETURN ABOVE VARIABLE COSTS¹⁷				188.28	265.29	349.27	389.30	
RETURN ABOVE VARIABLE AND LAND COSTS				41.28	66.29	90.27	130.30	
RETURN ABOVE TOTAL COSTS				-184.58	-165.76	-147.97	-110.65	
RETURN TO LAND				-37.58	33.24	111.03	148.35	
RETURN TO LABOR AND MANAGEMENT				-113.16	-88.15	-64.17	-24.15	
RETURN TO LAND, LABOR AND MANAGEMENT				33.84	110.85	194.83	234.85	

12/7/2015



CORN SELECTED BUDGET STATS - 2016			
Item	Input	Yield in bushels/acre	
Receipts		163	196
Corn Price	\$3.85 /bushel	\$628.32	\$753.83
Variable Costs			
Seed Cost	\$275 /bag	\$110.00	\$116.88
Nitrogen (NH ₃)	\$650 /ton	\$75.38	\$92.95
P ₂ O ₅ (MAP)	\$540 /ton	\$31.35	\$37.62
K ₂ O (Potash)	\$390 /ton	\$14.32	\$17.18
Chemicals		\$56.08	\$56.08
Fuel/Diesel	\$2.25 /gallon	\$12.95	\$12.95
Breakeven Cost / Bu		\$2.34	\$2.15
Fixed Costs			
Labor and Management		\$78.02	\$84.29
Machinery Cost		\$130.45	\$130.45
Land Rent		\$199.00	\$259.00
Breakeven Cost / Bu		\$4.98	\$4.69
Returns			
Return to Total Costs		-\$153.22	-\$132.68
Return to Land		\$45.78	\$126.32



CORN SELECTED BUDGET STATS - 2016			
Item	Input	Yield in bushels/acre	
Receipts		178	213
Corn Price	\$3.95 /bushel	\$702.31	\$842.93
Variable Costs			
Seed Cost	\$275 /bag	\$110.00	\$116.88
Nitrogen (NH ₃)	\$585 /ton	\$75.92	\$93.19
P ₂ O ₅ (MAP)	\$486 /ton	\$30.74	\$36.90
K ₂ O (Potash)	\$351 /ton	\$14.04	\$16.85
Chemicals		\$44.87	\$59.87
Fuel/Diesel	\$2.25 /gallon	\$13.85	\$13.85
Breakeven Cost / Bu		\$2.07	\$1.98
Fixed Costs			
Labor and Management		\$66.72	\$73.75
Machinery Cost		\$86.96	\$86.96
Land Rent		\$152.67	\$192.67
Breakeven Cost / Bu		\$3.93	\$3.75
Returns			
Return to Total Costs		\$35.04	\$75.49
Return to Land		\$187.71	\$268.16



SOYBEAN SELECTED BUDGET STATS - 2016			
Item	Input	Yield in bushels/acre	
Receipts		49	58
Soybean Price	\$8.90 /bushel	\$433.43	\$519.76
Variable Costs			
Seed Cost	\$0.43 /1000 seeds	\$74.90	\$74.90
P ₂ O ₅ (MAP)	\$540 /ton	\$20.23	\$24.26
K ₂ O (Potash)	\$390 /ton	\$22.16	\$26.57
Chemicals		\$33.84	\$33.84
Fuel/Diesel	\$2.25 /gallon	\$7.34	\$7.34
Breakeven Cost / Bu		\$4.19	\$3.51
Fixed Costs			
Labor and Management		\$53.27	\$57.59
Machinery Cost		\$107.89	\$107.89
Land Rent		\$199.00	\$259.00
Breakeven Cost / Bu		\$11.93	\$10.65
Returns			
Return to Total Costs		-\$115.34	-\$103.68
Return to Land		\$83.66	\$155.32



WHEAT SELECTED BUDGET STATS - 2016			
Item	Input	Yield in bushels/acre	
Receipts		73	88
Wheat Price	\$4.70 /bushel	\$343.10	\$411.72
Variable Costs			
Seed Cost	0.031 /1000 seeds	\$43.40	\$43.40
N (UAN)	290	\$24.32	\$54.79
P ₂ O ₅ (MAP)	550 /ton	\$24.32	\$29.19
K ₂ O (Potash)	400 /ton	\$15.67	\$17.47
Chemicals		\$9.50	\$9.50
Fuel/Diesel	\$2.25 /gallon	\$10.13	\$10.13
Breakeven Cost / Bu		\$2.60	\$2.41
Fixed Costs			
Labor and Management		\$39.66	\$43.09
Machinery Cost		\$125.86	\$125.86
Land Rent		\$199.00	\$259.00
Breakeven Cost / Bu		\$8.91	\$8.30
Returns			
Return to Total Costs		-\$199.87	-\$215.49
Return to Land		-\$0.87	\$43.51



Reevaluating - 2016

1. Re-evaluate crop production inputs - re-examine ROI with \$3.50-\$4.00 Corn
Specialty fertility products, Prophylactic fungicide usage, Consider generic crop production products, seeding rates, seed treatments,
2. Re-evaluate P and K Fertilizer Applications (where possible according to soil tests)
3. Re-evaluate seed technology investment - re-examine ROI with \$3.50-\$4 Corn
4. Re-evaluate Machinery and Equipment line, sizing and add-ons
5. Renegotiate cash leases – lease decreases may decline in symmetry with the manner in which they increased
6. Reconsider hired labor and purchased service - consider more self repair and services (equipment repair, spraying, soil sampling etc.)
7. Re-evaluate farm yield ratios together with price ratios when determining crop mix
8. Re-examine family living expenses



Management Reminders

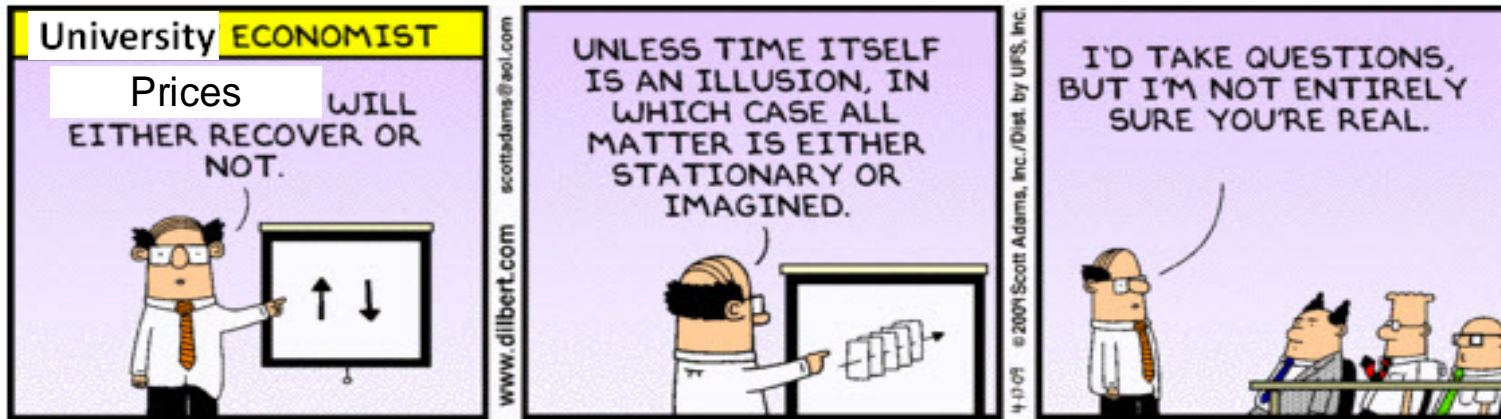
Seek corroborating research and evidence – don't rely on one advisor only

Reassess all costs – examine returns to each input especially those that are relatively new

Borrowing Capacity Check – Many growers have borrowed little operating funds lately

Stress Test - Conduct Balance sheet Sensitivity analysis – 5, 10 and 20% land value decrease

Farm financial analysis – FINPACK



Source: [Dilbert](#)

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- ◆ <http://aede.osu.edu/programs-and-research/osu-farm-management>