

## Land Values and Rents – Tools for analyzing the numbers

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## Land values and rates decision-making...

- When thinking of buying land (or selling), how do you determine what is an appropriate value?
- When thinking about renting crop land (or leasing it out), how do you determine the terms of the lease?

## Purpose of land talks

- Develop an understanding of the underlying economic principles and management aspects of land ownership and leasing
- Trying to reduce decisions to numbers
- Two decision tools:
  - *KSU-Landbuy.xls*
  - *KSU-Lease.xls*

Related papers are found at  
[www.agmanager.info](http://www.agmanager.info)

**Calculated values**  
**vs.**  
**Market values**

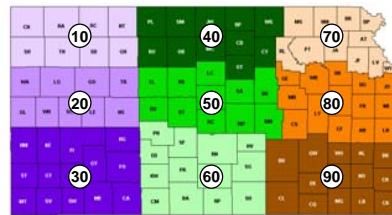
Which values are the “correct” ones?  
If market, why bother with calculations?

## Publicly available land data...

Historically Kansas Agricultural Statistics (KAS) reported average land values and cash rent rates for non-irrigated, irrigated, and pasture land at the crop reporting district (CRD) level

Beginning in 2009 KAS began reporting county-level cash rates (i.e., more intensive data), but in 2010 will discontinue reporting land values at the regional level (i.e., less intensive data).

*This is the market we observe and can reference. What you folks all face day to day is the real market.*



## KAS surveyed "market" rates...

USDA United States Department of Agriculture  
National Agricultural Statistics Service, Kansas Field Office  
**AGRICULTURAL LAND VALUES & CASH RENTS**  
Kansas Agricultural Statistics  
Cooperating with the Kansas Department of Agriculture  
PO Box 2054 • Topeka KS 66607-2054 • (785)235-2250 • www.ksas.usda.gov/kas • rates@ksas.usda.gov  
Released: September 10, 2010

**2010 Land Value Highlights**  
The average value of all farmland and buildings for 2010 in Kansas is estimated to be \$1,000 per acre. This compares with \$1,020 in 2009 and \$1,020 in 2008. Kansas' average value of all farmland and buildings increased 2.3 percent from 2009 to 2010. Irrigated cropland values rose 3.3 percent from 2009 while non-irrigated cropland increased 7.5 percent in value from last year. The value of Kansas pasture land increased 2.7 percent from 2009 at \$775.

**2010 Cash Rents**  
The 2010 average cash rent terms for non-irrigated cropland in Kansas was \$43.00 per acre, unchanged from 2009. The cash rental rates for non-irrigated cropland ranged from a low in Seward County of \$25 per acre to the high in Compton County of \$115 per acre. Compton County was followed by Brown County at \$105, Nemaha at \$82 and Adair at \$75. Seward was followed by Lane and Trego at \$26 and Geary at \$26.50. The District with the highest rent was the Northeast District at \$94 per acre.

The 2010 cash rental rate for irrigated cropland in Kansas averaged \$95 per acre, up from \$89 per acre in 2009. The Northeast District had the highest rate with \$121 per acre, followed by the Northwest at \$120 and the North Central at \$116. The Southeast District had the lowest irrigated rate with \$60 per acre.

The pasture cash rent averaged \$15.50 per acre in 2010, unchanged from the rate in 2009. The rent for pasture in Kansas ranged from \$6.50 per acre in Morton County for a low to \$32 per acre in Doniphan County for the high. Doniphan was followed by Marshall at \$24 and Brown at \$27.50. Morton was followed by Seward and Stevens at \$7 and Kearney and Hamilton at \$7.50. The Northeast District had the highest district-level rent per acre in the State at \$22 per acre.

**Kansas Farmland Values and Cash Rents, 2000 - 2010<sup>1</sup>**

Year	Value		Rent		Pasture and Buildings	All Farmland and Buildings
	Non-Irrigated	Irrigated	Non-Irrigated	Irrigated		
	Dollars per Acre		Dollars per Acre			
2000	1,040	930	66	87.00	380	12.80
2001	1,060	938	67	72.00	390	12.80
2002	1,080	940	67	72.00	400	12.80
2003	1,080	945	68	68.00	410	12.80
2004	1,080	950	68	72.00	420	13.20
2005	1,100	970	69	73.00	430	13.40
2006	1,200	920	84	74.00	590	13.70
2007	1,200	940	91	82.00	650	14.50
2008	1,400	960	100	82.00	780	15.50
2009	1,400	1,000	99	89.00	780	15.80
2010	1,500	1,020	95	95.00	770	16.50

<sup>1</sup>Rent rates are for land only. <sup>2</sup>2010 published in August 2011.

**Kansas Land Prices and Cash Rental Rates**  
Department of Agricultural Economics - www.agsystems.org  
Kansas State University Agricultural Experiment Station and Cooperative Extension Service  
Terry C. Obermeyer, Agricultural Economist, Professor Emeritus  
Farm Management Guide MF-1100

The Farm Management Guide reports Kansas land prices and cash rents for 1991-2009. These data are useful to farm managers in determining cash rental rates, in formulating agreements for calculating indices for making time adjustments in land prices, and in budgeting and assessing value. These data are reported on historical price and rental levels for farmland. The average prices for the guide represent percentages of land that vary widely by productivity. Thus, these data are more appropriate for analyzing trends than for establishing market value or rental rates for specific tracts of farmland.

**Kansas Land Prices**  
Table 1 through 5 show average prices of land and buildings. Table 1 shows district and an average for the state for the most recent 20 years reported. Data are shown for each of the five land groupings all land, farmland, all cropland, nonirrigated cropland, irrigated cropland, and pasture. The annual data are based on a survey conducted by Kansas Agricultural Statistics in June of each year asking for estimates of each January 1 land values and the percentage change in land values from the previous year as of June 1.

**Table 1. Price per acre of all land in farms and buildings, Kansas Agricultural Statistics Districts, 1991-2009<sup>1</sup>**

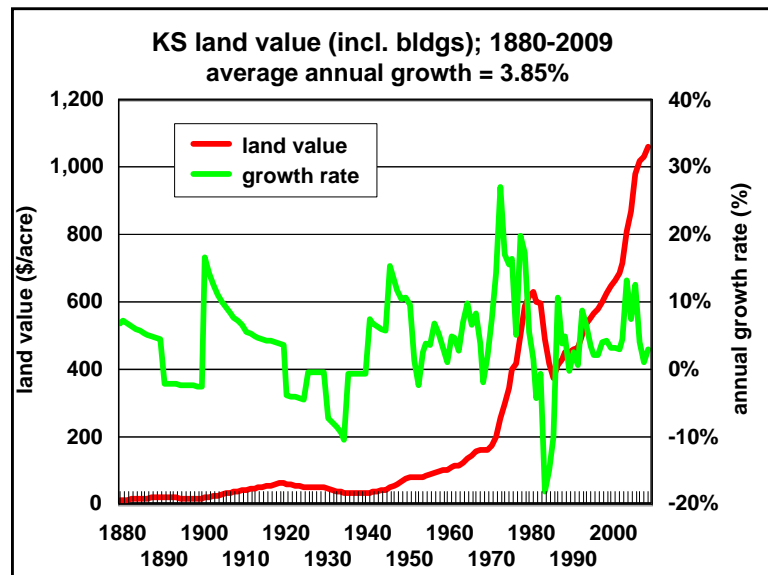
Year	All	Farmland	Non-Irrigated Cropland	Irrigated Cropland	Pasture and Buildings	All Farmland and Buildings
1991	\$389	\$453	\$219	\$419	\$215	\$419
1992	399	451	212	427	221	427
1993	401	445	211	428	221	428
1994	411	464	227	445	229	445
1995	416	464	227	445	229	445
1996	421	464	227	445	229	445
1997	426	464	227	445	229	445
1998	430	464	227	445	229	445
1999	435	464	227	445	229	445
2000	440	464	227	445	229	445
2001	445	464	227	445	229	445
2002	450	464	227	445	229	445
2003	455	464	227	445	229	445
2004	460	464	227	445	229	445
2005	465	464	227	445	229	445
2006	470	464	227	445	229	445
2007	475	464	227	445	229	445
2008	480	464	227	445	229	445
2009	485	464	227	445	229	445
2010	490	464	227	445	229	445

<sup>1</sup>Rent rates are for land only. <sup>2</sup>2010 published in August 2011.

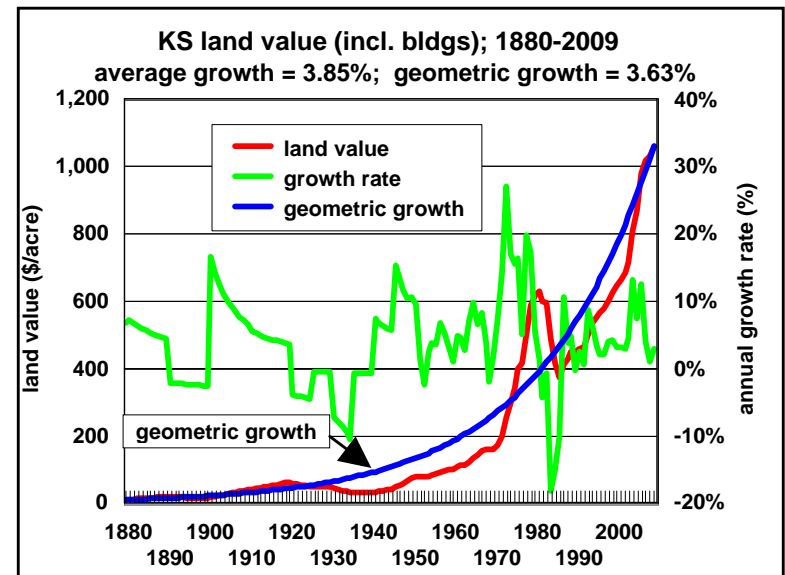
**KAS report** (switched to county-level in 2009, will drop CRD-level land values after 2010)

**KSU report** – basically a repackaging of KAS data (show more history)

## Historical perspective

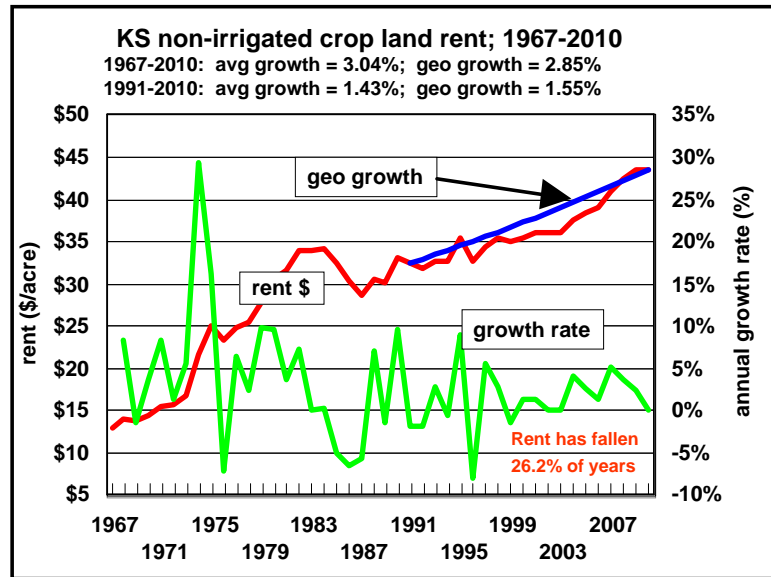


## Historical perspective



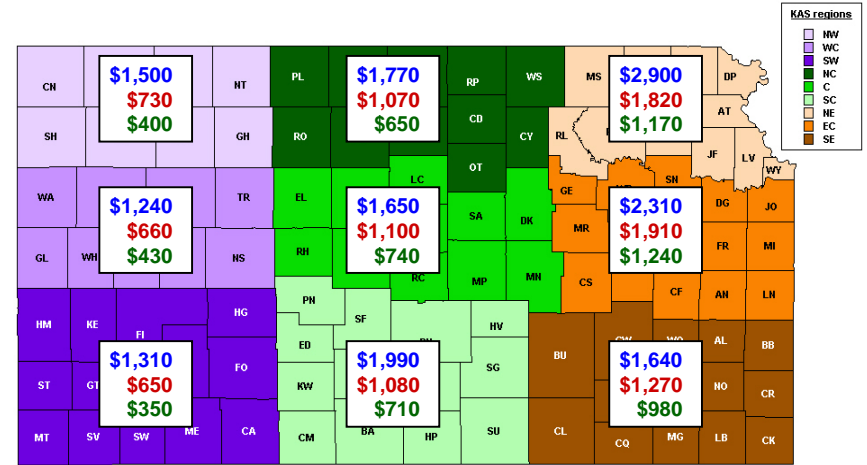
1879 starting land value for Kansas was \$10.30

### Cash rent historical perspective



1967-2009 average land value growth = 5.09%

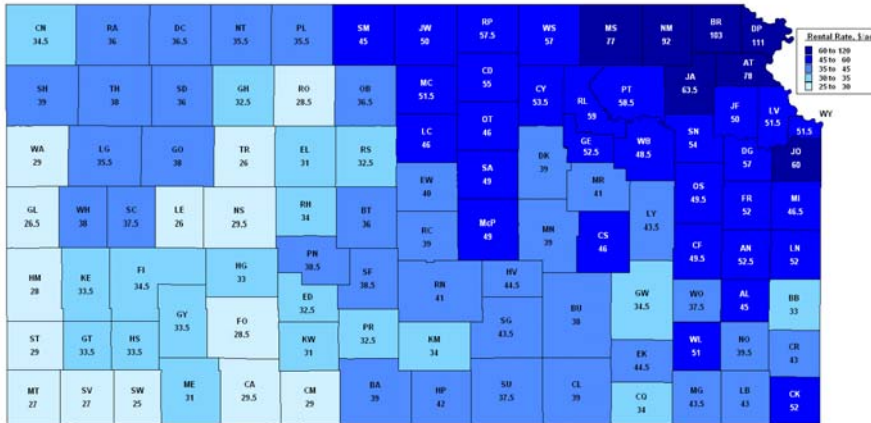
### June 1, 2010 "market" values...



Irrigated – State average = \$1,550  
 Non-irrigated – State average = \$1,070  
 Pasture – State average = \$770

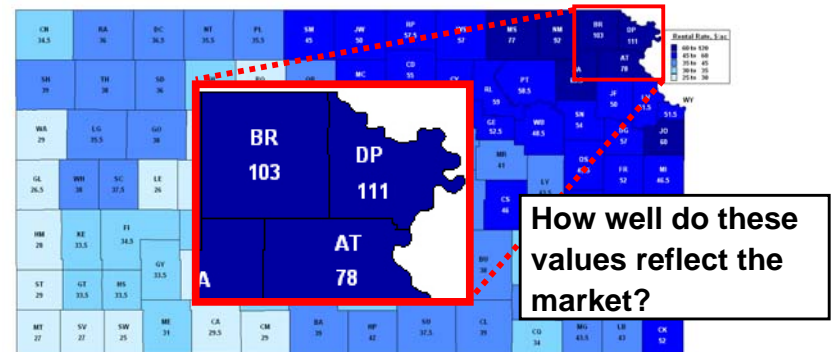
How well do these values reflect the market today?

### Kansas county-level non-irrigated crop cash rents...



\* 2010 Cash rent values as reported by USDA NASS and Kansas Agricultural Statistics (KAS).

### Kansas county-level non-irrigated crop cash rents...



\* 2010 Cash rent values as reported by USDA NASS and Kansas Agricultural Statistics (KAS).

Averages can be misleading because...

- 1) Not all land is equal
- 2) Not all relationships are equal

**Example of market established crop shares...**

Table 11. Northeast-70 Nonirrigated Crop-Share Arrangements				
Crop	Landlord's Percent of Crop Received (or of Costs Paid)*			
	33% Share	40% Share	50% Share	Other % Share
<b>Wheat (21 Leases)</b>	3	10	8	
% of Total Leases in Lease Arrangement	14.30%	47.60%	38.10%	No Responses
% of Leases Sharing Fertilizer Costs	100.00%	100.00%	100.00%	
% of Leases Sharing Herbicide Costs	33.30%	60.00%	100.00%	
% of Leases Sharing Insecticide Costs	33.30%	40.00%	62.50%	
<b>Corn (54 Leases)</b>	2	9	42	1
% of Total Leases in Lease Arrangement	3.70%	16.70%	77.80%	1.80%
% of Leases Sharing Fertilizer Costs	100.00%	100.00%	100.00%	100.00%
% of Leases Sharing Herbicide Costs	100.00%	88.90%	95.20%	100.00%
% of Leases Sharing Insecticide Costs	100.00%	88.90%	76.20%	100.00%
<b>Sorghum (11 Leases)</b>	1	7	3	
% of Total Leases in Lease Arrangement	9.10%	63.60%	27.30%	No Responses
% of Leases Sharing Fertilizer Costs	100.00%	100.00%	100.00%	
% of Leases Sharing Herbicide Costs	0.00%	85.70%	100.00%	
% of Leases Sharing Insecticide Costs	0.00%	57.10%	66.70%	
<b>Soybeans (43 Leases)</b>	4	14	25	
% of Total Leases in Lease Arrangement	9.30%	32.60%	58.10%	No Responses
% of Leases Sharing Fertilizer Costs	100.00%	100.00%	100.00%	
% of Leases Sharing Herbicide Costs	100.00%	92.90%	76.00%	
% of Leases Sharing Insecticide Costs	100.00%	78.60%	52.00%	
<b>Other Hay (8 Leases)</b>	2	2	4	
% of Total Leases in Lease Arrangement	25.00%	25.00%	50.00%	No Responses
% of Leases Sharing Fertilizer Costs	100.00%	100.00%	100.00%	
% of Leases Sharing Herbicide Costs	0.00%	0.00%	100.00%	
% of Leases Sharing Insecticide Costs	0.00%	0.00%	100.00%	

\* The percentages calculated in this table represent the percent of landlords sharing the same percent of costs as they share of the crop. For example, 100% of landlords receiving 33% of the wheat crop paid 33% of fertilizer expenses.

Source: Schlegel and Tsoodle -- 2007 KAS/KSU survey (available at [www.agmanager.info](http://www.agmanager.info))

**Calculated values  
vs.  
Market values**

**If (when) market values have very little meaning to individual situations, we need to estimate what we believe might be the more “correct” values.**

**Determining the terms of a crop lease...**

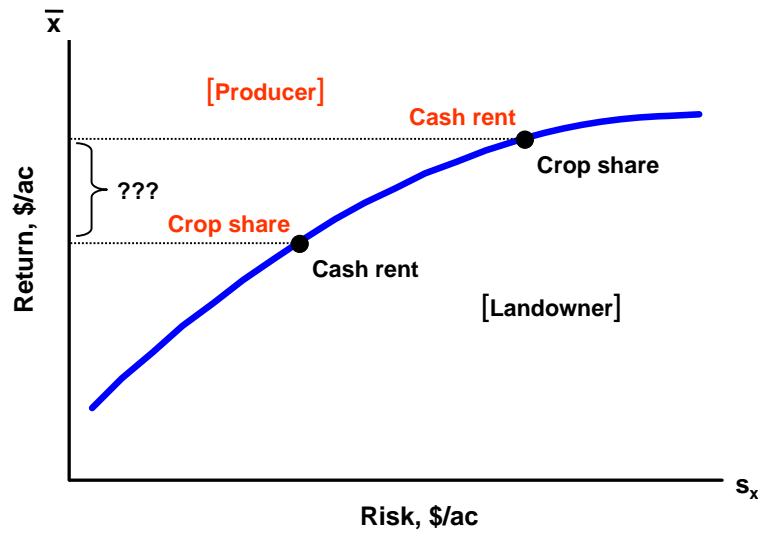
- When market reported rates are not sufficient to answer the question at hand, what do we do?
- While landowners and tenants (i.e., the market) ultimately determine terms of crop share and cash leases, we use the equitable concept to arrive at a starting point for negotiations – and to better understand the market.

**Principles embodied in an equitable lease...**

- Profit maximization (MR=MC)
- Economic profits (expected profit = 0\*)
- Opportunity costs
- Risk across lease types
- Equal rates of return on annual investment (if economic profit = 0, then rate of return = 0)

\* On average, in the long run.

# Landowner/producer risk-return tradeoff



Microsoft Excel - KSU Lease.xls

KSU Lease.xls ---- A spreadsheet budgeting program to determine equitable crop share and cash lease rental arrangements.

Version -- 1.9.10

**INPUTS vs CALCULATED VALUES**  
 In the *Crop budgets*, *Shares*, and *Lease budgets* sheets all blue numbers are inputs and all black numbers are calculated from these inputs. The spreadsheet automatically recalculates every time an additional input is entered. Thus, it is important to wait until all data have been entered and reviewed before interpreting any of the calculated results (i.e., black numbers).

**DESCRIPTION OF INPUTS**  
 The paper titled *KSU Lease.xls.pdf* serves as a "users guide" and provides a brief overview of this spreadsheet. Also, several of the input cells (i.e., blue number) have a red diamond in the upper right hand corner of the cell. By moving your mouse cursor over this diamond, a brief description of the input will be displayed on the screen.

**COMPANION PUBLICATIONS**  
 This spreadsheet was developed as a decision-aid tool based on the principles of equitable leases outlined in several publications that can be found on the K-State Ag Econ departmental website (www.agenon.ksu.edu). Additionally, the budget format of this spreadsheet was designed to follow that of the K-State Farm Management Guide crop budgets, which are also available on the Ag Econ website, so they can also be a useful resource when analyzing leasing alternatives.

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AG MANAGER.INFO  
 Kansas State University  
 Department of Agricultural Economics

Ready

AG MANAGER.INFO  
 www.agmanager.info

## Projected crop budgets are available on agmanager.info (serve as a starting point)

Home Farm Management FM Guides Nonirrigated Crops

### Non-irrigated Crops

Crop	Western	South Central	North Central	Northeast	Southeast	Southwest
Wheat	MF-903	MF-574	MF-2159	MF-572	MF-992	
Grain Sorghum	MF-904	MF-575	MF-2159	MF-573	MF-995	
Forage Sorghum Silage		MF-649				
Soybeans	MF-2366	MF-2156	MF-2160	MF-670	MF-994	
Double Crop Soybeans		MF-2537	MF-2537	MF-2537	MF-2537	
Corn	MF-2150	MF-2157	MF-2161	MF-571	MF-993	
Corn Silage				MF-2364		
Sunflower	MF-837		MF-2144	MF-2144		
Double Crop Sunflower		MF-2145	MF-2145	MF-2145	MF-2145	
Canola		MF-2421				
Cane Hay	MF-997					
Alfalfa	MF-2367	MF-363	MF-363	MF-363	MF-363	
Cotton		MF-939			MF-939	MF-2565
Brome Hay		MF-2143	MF-2143	MF-2143	MF-2143	
Fescue Hay		MF-2146	MF-2146	MF-2146	MF-2146	

Excel Version of Crop Budgets: FM\_Guides\_-\_Crops\_-\_2009.xls

Department of Agricultural Economics K-State Research & Extension College of Agriculture Kansas State University

Go to [KSU-Lease.xls](#)

## Crop budgets for NE Kansas using 5-year average crop prices.

TABLE 1. CROP BUDGETS SHOWING TOTAL COSTS AND RETURNS									
Crop System	Wht R	Wht C	Milo	Corn	SB FS	SB DC	Total	Per Acre	Per Acre
Planted acres of each crop	20.0	0.0	0.0	40.0	40.0	0.0	100.0	Planted	Tillable
Tillable acres per planted acre	1.00	1.00	1.00	1.00	1.00	0.00	100.0		
<b>INCOME PER ACRE</b>									
A. Yield per acre	60.0	49.0	90.0	133.0	40.0	25.0	---	---	---
B. Price per unit	\$6.15	\$6.15	\$3.85	\$4.05	\$9.95	\$9.95	\$44.847	---	\$448.47
C. Net government payments	\$13.60	\$13.60	\$13.60	\$13.60	\$13.60	\$0.00	\$1,360	\$13.60	\$13.60
D. Indemnity payments	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0	\$0.00	\$0.00
E. Miscellaneous income	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0	\$0.00	\$0.00
F. Returns/acre (A x B) + C + D + E	\$382.67	\$315.01	\$360.10	\$552.25	\$411.60	\$248.75	\$46,207	\$462.07	\$462.07
<b>COSTS PER ACRE</b>									
1. Seed	\$15.00	\$13.50	\$15.60	\$86.94	\$46.20	\$49.50	\$5,626	\$56.26	\$56.26
2. Herbicide	11.69	11.69	30.07	29.90	10.04	9.08	1,831	18.31	18.31
3. Insecticide / Fungicide	27.90	0.00	0.00	27.90	0.00	0.00	1,674	16.74	16.74
4. Fertilizer and Lime	69.80	56.80	61.20	93.40	26.00	25.50	6,172	61.72	61.72
5. Crop Consulting	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00
6. Crop Insurance	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00
7. Drying	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00
8. Miscellaneous	8.25	8.25	8.25	8.25	8.25	8.25	825	8.25	8.25
9. Machinery Expense	82.59	121.25	102.51	113.14	70.55	64.41	8,999	89.99	89.99
10. Non-machinery Labor	8.06	11.26	10.01	11.18	6.89	6.24	884	8.84	8.84
11. Irrigation	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00
12. Land Charge / Rent	110.00	110.00	110.00	110.00	110.00	0.00	11,000	110.00	110.00
G. SUB TOTAL	\$333.28	\$333.45	\$337.73	\$480.71	\$277.53	\$162.58	\$37,011	\$370.11	\$370.11
H. TOTAL COSTS	\$340.13	\$339.84	\$344.50	\$492.35	\$282.98	\$167.92	\$37,816	\$378.16	\$378.16
I. RETURNS OVER COSTS (F - H)	\$42.54	(\$24.84)	\$15.60	\$59.90	\$128.62	\$80.83	\$8,391	\$83.91	\$83.91
J. TOTAL COSTS/UNIT (H/A)	\$5.67	\$6.94	\$3.83	\$3.70	\$7.07	\$6.72	---	---	---
K. RETURN TO TOTAL COST ((F-H)/G)	14.82%	-5.53%	6.62%	14.88%	40.89%	52.63%	22.19%	22.19%	22.19%
<b>M. Breakeven price (w/ base crop)</b>									
M. Breakeven price (w/ base crop)	\$6.15	\$7.53	\$4.15	\$3.92	\$7.80	\$8.42	---	---	---
N. Breakeven yield (w/ base crop)	58.2	58.2	94.2	124.4	30.1	20.3	---	---	---

Returns over costs (i.e., profit) – one of the numbers to focus on. We expect it to be “close” to \$0, on average, in the long-run.

If it is “too high” (as is likely the case here), land values will increase.

OPERATOR'S share of machinery, labor, irrigation, and land (enter 100% if shared equitably)									
Crop System	Wht R	Wht C	Milo	Corn	SB FS	SB DC	Total		
Planted acres	20.0	0.0	0.0	40.0	40.0	0.0	100.0	Planted	Tillable
Drill Plant	100%	100%	100%	100%	100%	100%	100%		
Tillage and Chemical Applications:									
Chisel	100%	100%	100%	100%	100%	100%	100%		
Disk	100%	100%	100%	100%	100%	100%	100%		
Field cultivate	100%	100%	100%	100%	100%	100%	100%		
Cultivate w/seedbed	100%	100%	100%	100%	100%	100%	100%		
Anhydrous application	100%	100%	100%	100%	100%	100%	100%		
Fertilizer application	-100%	-100%	-100%	-100%	-100%	-100%	-100%		
Herbicide application	-100%	-100%	-100%	-100%	-100%	-100%	-100%		
Insecticide/fungicide application	-100%	-100%	-100%	-100%	-100%	-100%	-100%		
Harvest									
Harvest	100%	100%	100%	100%	100%	100%	100%		
Hauling	100%	100%	100%	100%	100%	100%	100%		
Miscellaneous	80%	80%	80%	80%	80%	80%	80%		
Non-machinery labor	100%	100%	100%	100%	100%	100%	100%		
Irrigation expenses									
Labor	100%	100%	100%	100%	100%	100%	100%		
Fuel and oil	-100%	-100%	-100%	-100%	-100%	-100%	-100%		
Repair and maintenance	100%	100%	100%	100%	100%	100%	100%		
Irrigation investment									
Well, pump, and gearhead	100%	100%	100%	100%	100%	100%	100%		
Motor	100%	100%	100%	100%	100%	100%	100%		
Irrigation system	100%	100%	100%	100%	100%	100%	100%		
Land	0%	0%	0%	0%	0%	0%	0%		
Cash payment to landowner, \$/acre	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		
Operator's equitable share (OS%)	45.4%	54.4%	51.5%	64.5%	51.1%	98.6%	56.7%		
Landowner's equitable share (LS%)	54.6%	45.6%	48.1%	35.5%	48.9%	1.4%	43.3%		

“Calculated” values for what is equitable – numbers to focus on.

Typically what people are doing is equitable and thus this provides a check on costs in budget.

If landowners in area are typically getting a higher percentage than the calculated value (and profit > \$0), land charge likely should be increased.

TABLE 8. ALTERNATIVE METHODS OF ESTIMATING CASH RENT									
Crop System	Wht R	Wht C	Milo	Corn	SB FS	SB DC	Total	Per Acre	Per Acre
Total tillable acre	20.0	0.0	0.0	40.0	40.0	0.0	100.0	Planted	Tillable
Planted acres of each crop	20.0	0.0	0.0	40.0	40.0	0.0	100.0		
<b>A. Landowner's COST</b>									
Land	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00	\$0.00	\$11,000	\$110.00	\$110.00
Irrigation equipment	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0	\$0.00	\$0.00
Total	\$110.00	\$110.00	\$110.00	\$110.00	\$110.00	\$0.00	\$11,000	\$110.00	\$110.00
<b>B. Landowner's EQUITABLE SHARE RENT</b>									
Total income	\$382.67	\$315.01	\$360.10	\$552.25	\$411.60	\$248.75	\$46,207	\$462.07	\$462.07
Landowner's share	43.3%	43.3%	43.3%	43.3%	43.3%	43.3%	\$20,003	\$200.03	\$200.03
Landowner's income	\$165.65	\$136.36	\$155.88	\$239.06	\$178.18	\$107.68	\$20,003	\$200.03	\$200.03
Landowner operating expense	61.37	43.05	50.73	77.58	25.99	22.40	5,370	53.70	53.70
Income less operating expense	\$104.28	\$93.31	\$105.15	\$161.48	\$152.19	\$85.28	\$14,633	\$146.33	\$146.33
Less risk adjustment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cash rent equivalent	\$104.28	\$93.31	\$105.15	\$161.48	\$152.19	\$85.28	\$14,633	\$146.33	\$146.33
<b>C. Amount tenant CAN AFFORD TO PAY</b>									
Total income	\$382.67	\$315.01	\$360.10	\$552.25	\$411.60	\$248.75	\$46,207	\$462.07	\$462.07
Total operating expense	\$270.13	\$229.84	\$234.50	\$382.35	\$172.98	\$167.92	\$26,816	\$268.16	\$268.16
Return to land and Ir equip	\$152.54	\$85.16	\$125.60	\$169.90	\$238.62	\$80.83	\$19,391	\$193.91	\$193.91

Cash rent from budget vs. cash rent equivalent with crop share (and imputed risk premium) – numbers to focus on.

Historically we have suggested a risk premium of ~10% (i.e., the value that would drive cash rent (A) and cash rent equivalent (B) equal – in this example it is closer to 25%).

If risk premium is “too high” this suggests that land rent will likely increase.

## Factors/issues impacting land values (alphabetical order)

- Farm profitability
- Farm size
- Government programs
- Input costs (e.g., fuel and fertilizer)
- Interest rates
- Outside investors (i.e., stock market money)
- Recreation uses (e.g., hunting)
- Renewable fuels (ethanol and bio-diesel)
- Section 1031 tax exchanges
- Technology (e.g., no-till, precision ag, bio-tech, DNA)
- Urban sprawl
- Weather (i.e., drought, flood)

What are the main factors today?

## Returns to Land

- Land
  - Cash returns: rents or rent-equivalents on owned land
  - Non-cash returns: capital gains (growth)
- Stock market
  - Cash returns: dividends
  - Non-cash returns: capital gains (growth)
- Typically, neither land nor stock investments “cash flow”

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**KSU-Landbuy.xls -- A spreadsheet program to analyze land purchase prices and land values in general.**

Version -- 9.06.10

**INPUTS vs CALCULATED VALUES**  
In the *KSU-Landbuy* sheet all blue numbers in shaded cells are inputs and all other numbers are calculated from these inputs. The spreadsheet automatically recalculates every time an additional input is entered. Thus, it is important to wait until all data have been entered and reviewed before interpreting any of the calculated results (i.e., black numbers).

**DESCRIPTION OF INPUTS**  
Several resources exist to aid in the use of this spreadsheet. 1) The paper titled *Valuing and Buying Farmland* (paper at [www.agmanager.info/farmmg/land/land\\_buy](http://www.agmanager.info/farmmg/land/land_buy)) serves as a user's guide and provides a more detailed documentation of the concepts and formulas used in this spreadsheet. 2) The input cells (i.e., blue numbers) have a red diamond in the upper right hand corner of the cell (if the comments do not appear go to View / Comments on the Excel menu). By moving your mouse cursor over this diamond, a brief description of the input will be displayed on the screen. 3) A video file (*KSU-Landbuy.wmv*) and an audio file (*KSU-Landbuy.mp3*) -- available at [www.agmanager.info/farmmg/land/land\\_buy](http://www.agmanager.info/farmmg/land/land_buy) -- can be played on your computer providing a brief explanation of the inputs and outputs line by line.

**Developed by:** Terry L. Kastens, Professor Emeritus, Kansas State University; Kevin C. Dhuyvetter, Extension Agricultural Economist, Kansas State University.

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Links to supporting materials: [Valuing and buying farmland](#) (on [www.agmanager.info](#)); [KSU-Landbuy.wmv](#); [KSU-Landbuy.mp3](#)

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**Inputs**

	KS	KS	KS	Average
Crop	150	0	10	160
\$3,500	\$1,200	\$0	\$3,281	
\$125.00	\$20.00	\$0.00	\$117.19	
\$14.00	\$4.80	\$0.00	\$13.13	
\$0.00	\$0.00	\$0.00	\$0.00	
30	30	30	30	
43%	43%	43%	43%	
15%	15%	15%	15%	
6.50%	6.50%	6.50%	6.50%	
40.0%	40.0%	40.0%	40%	
2.64%	2.64%	0.00%	2.64%	
0.00%	0.00%	0.00%	n/a	
3.85%	3.85%	0.00%	3.85%	
1.18%	1.25%	0.00%	1.18%	

**Calculated Outputs**

	KS	KS	KS	Average
3.71%	3.71%	3.71%	3.71%	
\$63.27	\$8.66	\$0.00	\$59.32	
\$1,623.92	\$218.90	\$0.00	\$1,522.42	
\$0.00	\$0.00	\$0.00	\$0.00	
\$10,871	\$3,727	\$0	\$10,191	
\$7,648	\$2,529	\$0	\$7,170	
\$3,279	\$1,124	\$0	\$3,074	
\$2,359	\$785	\$0	\$2,212	
\$4,903	\$1,343	\$0	\$4,596	
81%	75%	n/a	81%	
48%	19%	n/a	---	
\$1,402.54	\$143.00	\$0.00	\$1,314.89	
\$1,402.54	\$143.00	\$0.00	\$1,314.88	
9.03%	7.25%	n/a	9.03%	
10.72%	7.75%	n/a	10.72%	

**Labels** (refers to notation in *Valuing and Buying Farmland* publication)

- State where land is located (enter as two letter abbreviation, e.g., Kansas = KS)
- Land classification (e.g., cropland, pasture, woods)
- Enter the acres of each class of land (used to calculate weighted average)
- Market price of land, \$/acre
- Purchase price (PP -- amount you pay), \$/acre
- Ag rent--cash or cash equivalent in \$/acre today
- Real estate (property) tax in \$/acre today
- Non-ag rent in \$/acre today
- Time horizon in years land is held (less than or equal to 100 years)
- Income tax rate (on last dollar of taxable income -- include SE tax if relevant)
- Capital gains tax rate
- Interest rate on land loans (discount rate)
- Percent of purchase price that is financed (only needed for return on equity calculations)
- Growth rate on ag rent and ag portion of land value (see column G in Guidelines)
- Growth rate on non-ag rent (normally = inflation rate)
- Growth rate on total (ag and non-ag) land value (see column I in Guidelines)
- Calculated non-ag growth rate on land value

**Calculated Outputs**

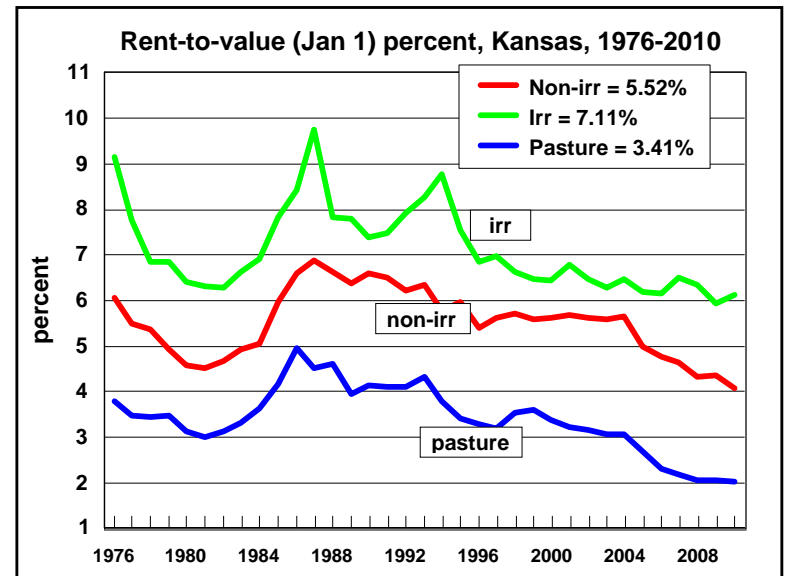
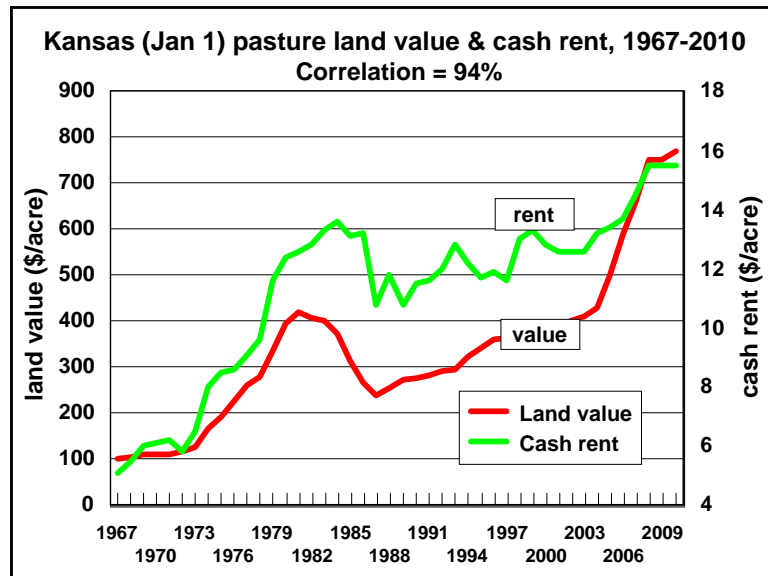
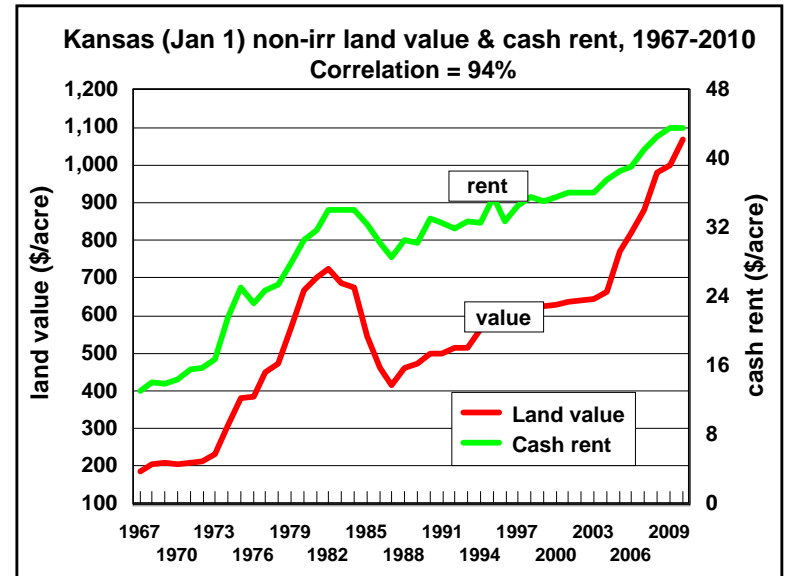
- After-tax interest rate on land loans (discount rate)
- After-tax rent, \$/acre (now property taxes are removed as well)
- Discounted value of all future after-tax ag rents
- Discounted value of all future after-tax non-ag rents
- Projected land value in 30 years, based on market price and ag & non-ag growth
- Projected land value in 30 years, based on market price and only ag growth
- Discounted value of land sale in 30 years (after capital gains tax)
- Discounted value of land sale in 30 years (after capital gains tax) -- if only ag growth
- Present value of land purchase
- Ag market value percent implied by non-ag rent and growth inputs
- Ag market value percent implied by Ag Rent-to-Value (column J of Guidelines) and after-tax ca
- Present value less market price
- Present value less purchase price
- Approximate pre-tax rate of return on assets
- Approximate pre-tax rate of return on equity

Go to [KSU-Landbuy.xls](#)

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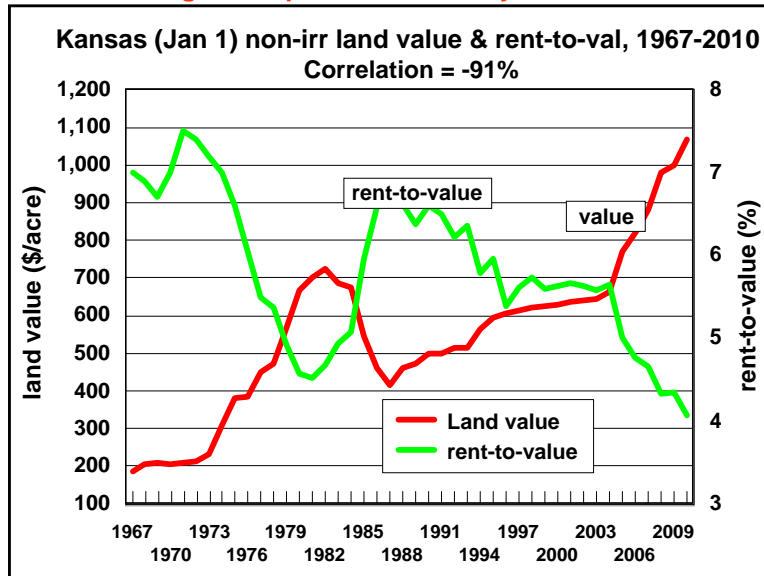
**The BIG Question(s):**

**Are we in a bubble?  
Are we on the verge of a 1980s repeat?**



**Downtrend hints at something else going on besides ag profits . . .**

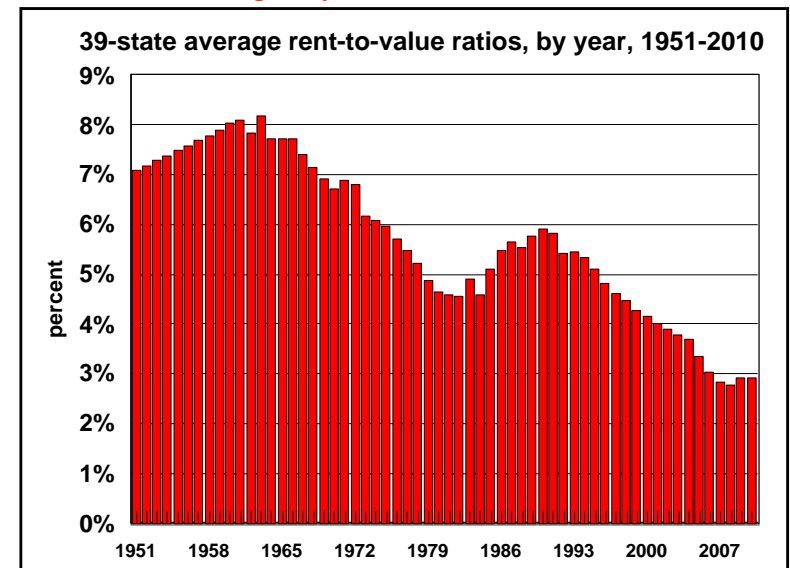
### Are we seeing a land price bubble today?



Just how important is rent-to-value as an indicator of smart investing?

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### Have investors been grossly unwise for decades?



Is RTV really a reliable indicator of land price bubbles?

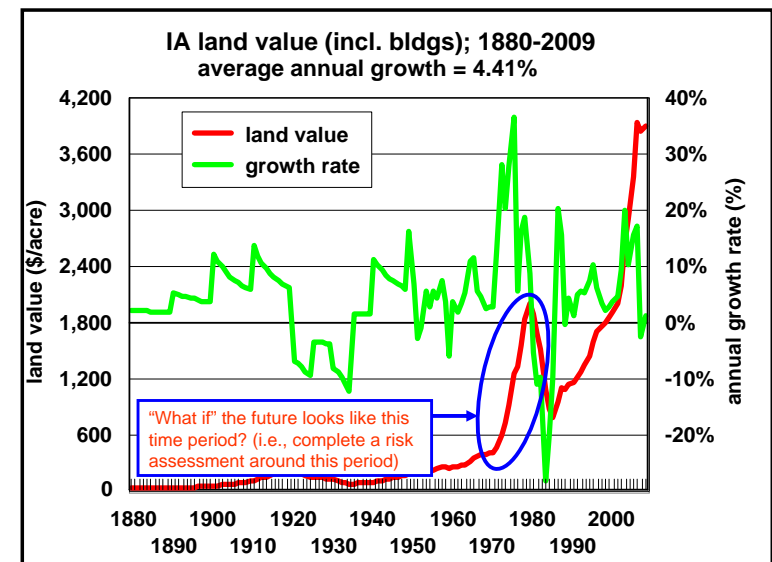
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### Are we approaching the 1980s?

- Most economists will say NO, pointing to:
  - Much lower interest rates today
  - Much lower leverage today
  - Much lower inflation today
  - Growing world demand, especially China
- A few economists will say YES, pointing to:
  - China is unpredictable
  - Interest rates will soon rise
  - Lenders will get caught up (e.g., housing bubble)
  - Economists never see a bubble from the inside
- We ask the more direct question, What happens if we see land value and growth rates like the 1970s-1980s?

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### Historical perspective

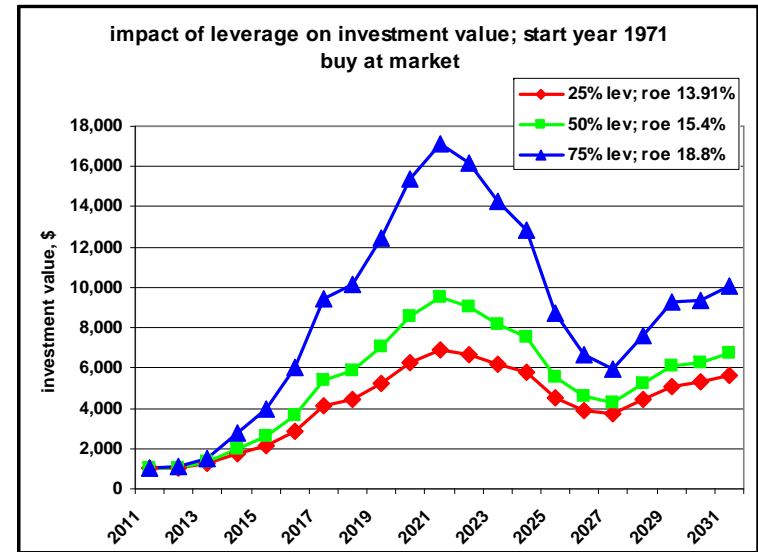


36

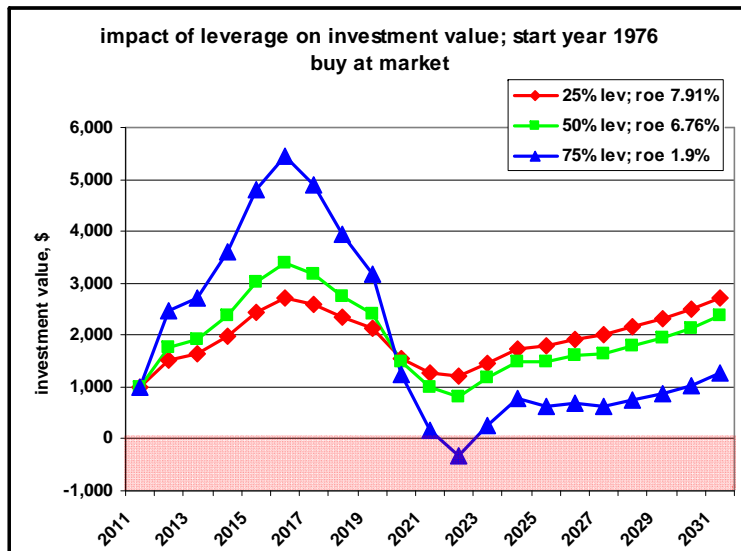
## Our analysis

- Today's expected growth rates from the vantage points of 1971, 1976, 1981, & avg
- Market value of IA land pegged to 4.5% rent
- 20-year horizon
- 0.5% of market property tax rate
- Interest rate of 6.5%
- Income tax rate of 35%
- A \$1000 investment
- Report value path and pre-income-tax ROE
  - For different leverage rates
  - For different rates of above-market purchasing

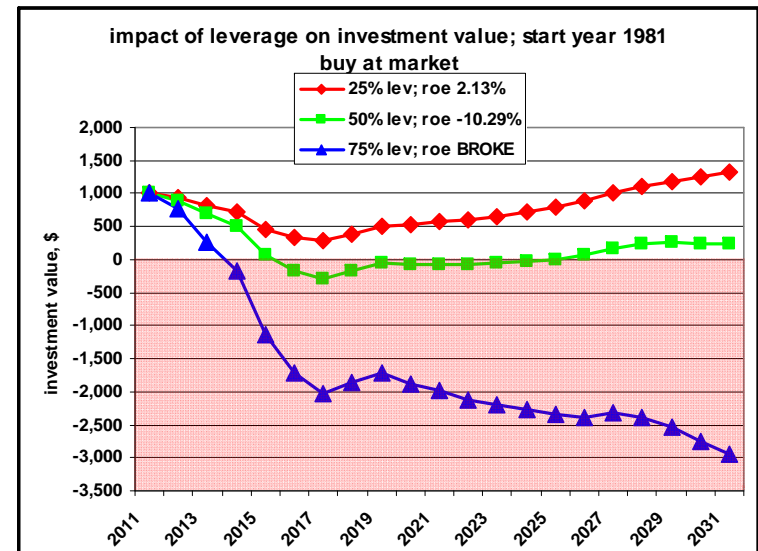
## We first consider leverage issues



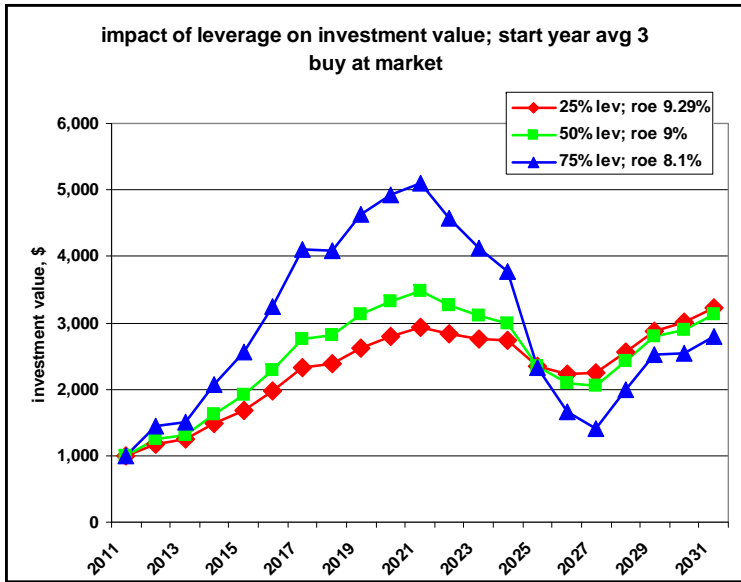
No problems here . . . If 2011 is akin to 1971!



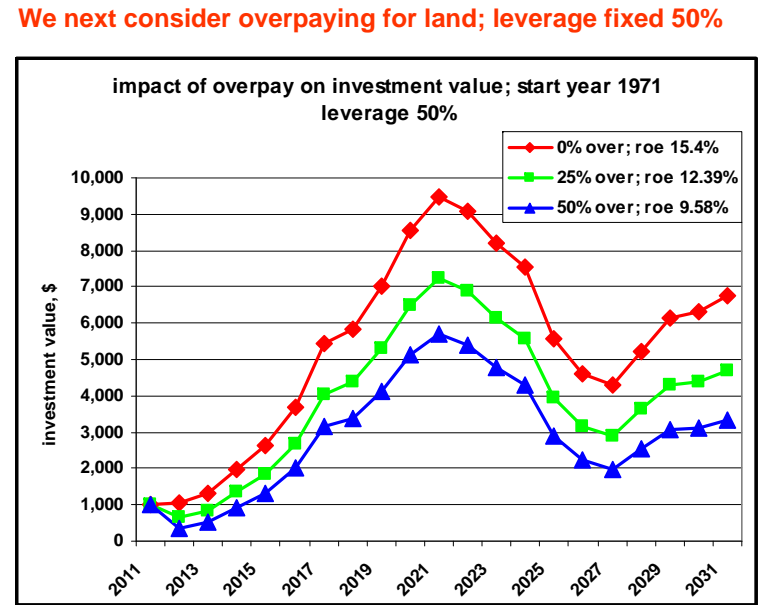
Don't borrow excessively if 2011 is like 1976



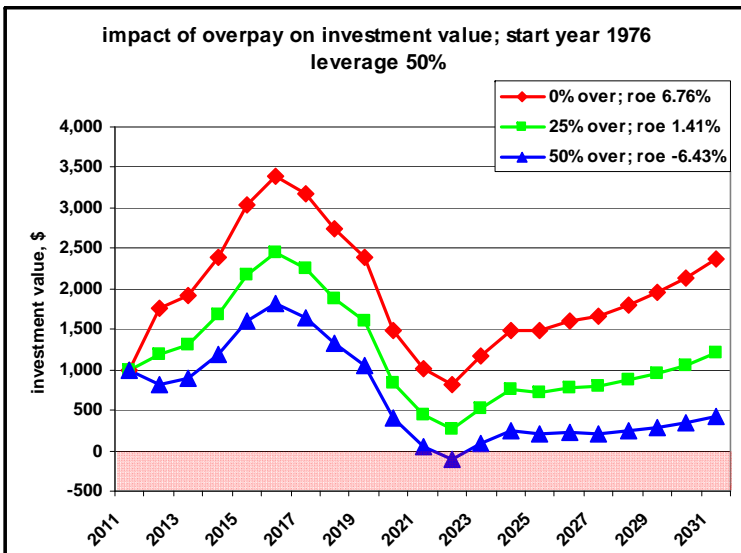
High leverage and buying at the top could be painful



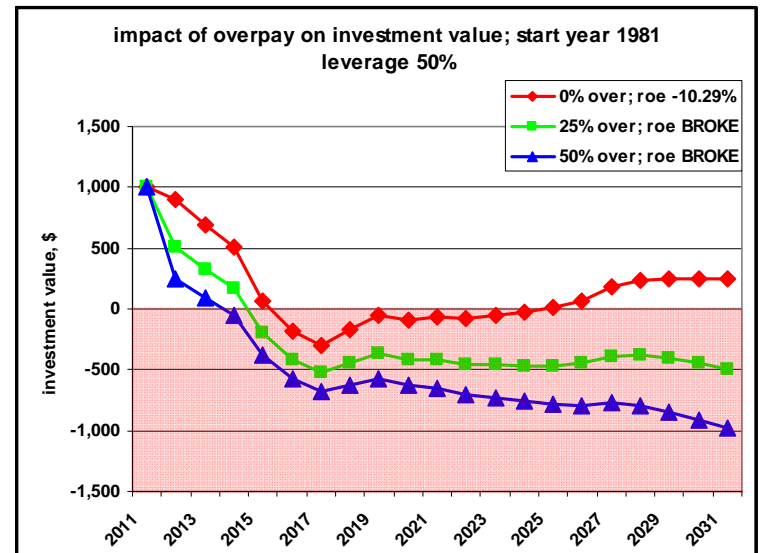
2011 like 1971 & 1976 & 1981 – more like we might expect??



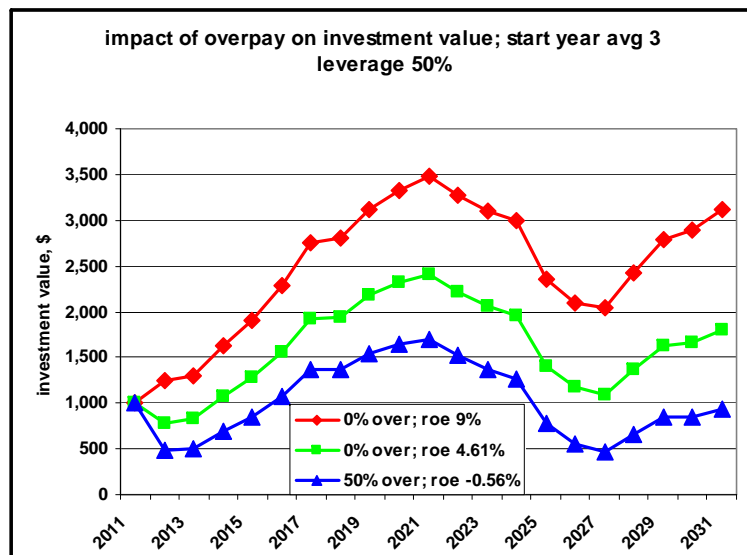
If the glory days are ahead of you it is not that painful to overbid on land



Don't overbid on land if 2011 is like 1976



Buying at the top AND even modest overbidding on land can kill you



2011 like 1971 & 1976 & 1981 – more like we might expect??

## Results of analysis...

### Summary of Results -- Impact on 20-year pre-income tax ROE

Impact of leverage rate on investment value -- buy at market				
Start year "looks like"...				
Leverage	1971	1976	1981	Avg of 3
25%	13.91%	7.91%	2.13%	9.29%
50%	15.40%	6.76%	-10.29%	9.00%
75%	18.80%	1.90%	Broke	8.10%

Impact of overpay on investment value -- leverage 50%				
Start year "looks like"...				
Overpay	1971	1976	1981	Avg of 3
0%	15.40%	6.76%	-10.29%	9.00%
25%	12.39%	1.41%	Broke	4.61%
50%	9.58%	-6.43%	Broke	-0.56%

## Summary ...

- Market trumps our calculated values, but we calculate values to avoid making bad decisions
- To reduce risk associated with renting land, consider:
  - Staying with (going back to) crop share
  - Go to a flexible cash rent (not ad hoc bonuses)
  - Renegotiate often (i.e., every year) and be willing to increase *and* decrease rents annually
  - Increase level of communication
- If buying land in current market, avoid high leverage and paying premiums (i.e., continue to look for the “best” deals)

# Questions ???

