Land Values – Trends and Analysis

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Purpose of land talks

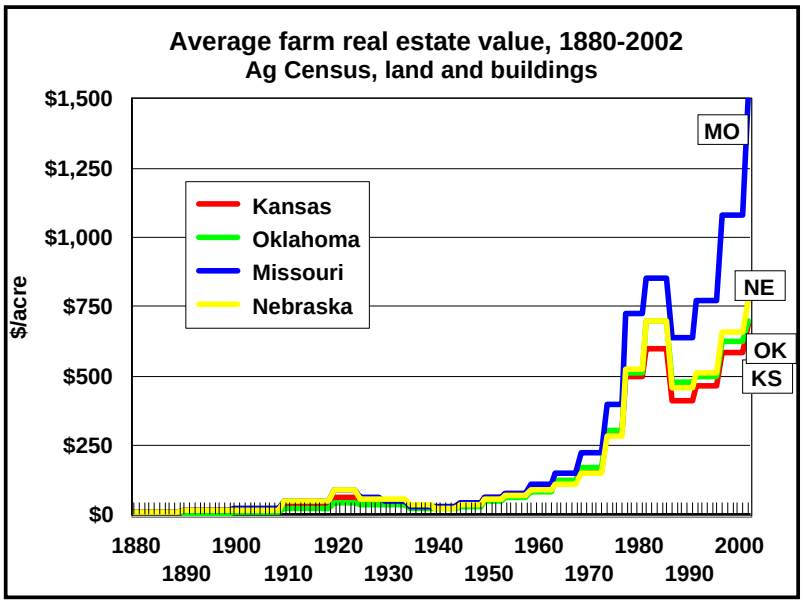
- Develop an understanding of the underlying economic principles and management aspects of land ownership and leasing
- Trying to reduce decisions to numbers
- Two decision tools:
  - *KSU-Landbuy.xls*
  - *KSU-Lease.xls*

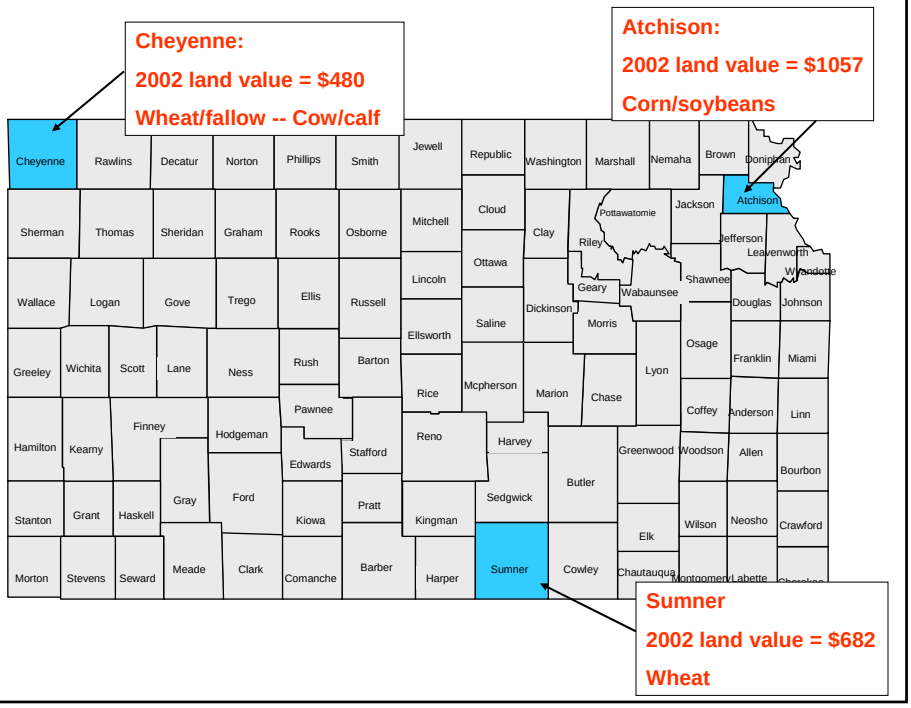
Related papers are found at
www.agmanager.info

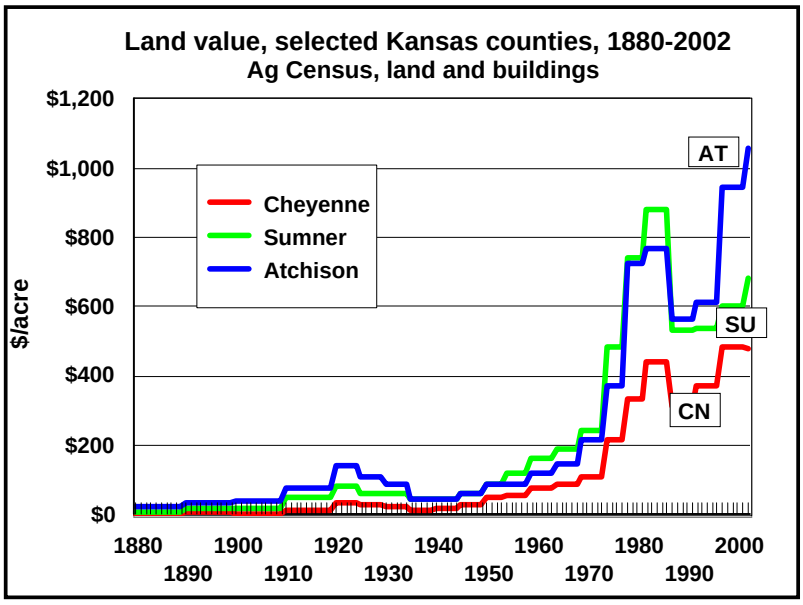
Historical land values and growth

Land is Unique

- Most fixed of farming assets
  - Residual claimant
  - Capitalizes government subsidies
- Often is taxed
  - Favorably or unfavorably
- Has non-ag benefits that may be pecuniary
- Has non-pecuniary benefits
- A long term investment involving long term expectations – history is a guide


Average farm real estate value, 1880-2002
Ag Census, land and buildings
$1,500
$1,250
$1,000
$750
$500
$250
$0
$/acre
Kansas
Oklahoma
Missouri
Nebraska
MO
NE
OK
KS
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000


Cheyenne:
2002 land value = $480
Wheat/fallow -- Cow/calf
Atchison:
2002 land value = $1057
Corn/soybeans
Sumner
2002 land value = $682
Wheat
Cheyenne
Rawlins
Decatur
Norton
Phillips
Smith
Jewell
Republic
Washington
Marshall
Nemaha
Brown
Doniphan
Sherman
Thomas
Sheridan
Graham
Rooks
Osborne
Mitchell
Cloud
Clay
Pottawatomie
Jackson
Atchison
Jefferson
Leavenworth
Wyandotte
Riley
Wallace
Logan
Gove
Trego
Ellis
Russell
Lincoln
Ottawa
Geary
Shawnee
Wabaunsee
Douglas
Johnson
Ellsworth
Saline
Dickinson
Morris
Greeley
Wichita
Scott
Lane
Ness
Rush
Barton
Rice
Mcpherson
Marion
Chase
Lyon
Osage
Franklin
Miami
Hamilton
Kearny
Finney
Hodgeman
Pawnee
Stafford
Reno
Harvey
Coffey
Anderson
Linn
Edwards
Greenwood
Woodson
Allen
Bourbon
Stanton
Grant
Haskell
Gray
Ford
Kiowa
Pratt
Kingman
Sedgwick
Butler
Wilson
Neosho
Crawford
Elk
Morton
Stevens
Seward
Meade
Clark
Comanche
Barber
Harper
Sumner
Cowley
Chautauqua
Montgomery
Labette



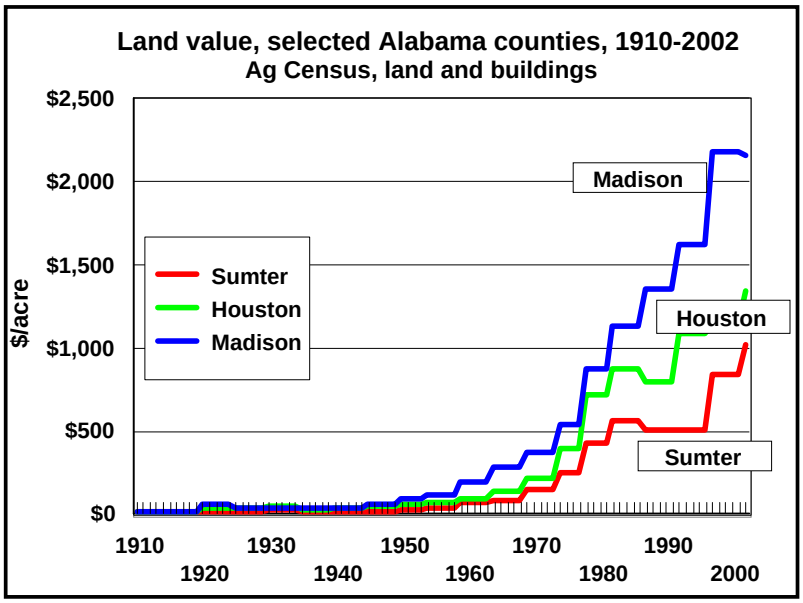
7

Madison:
2002 land value = $2161
Soybeans

Sumter:
2002 land value = $1018
Cow/calf

Houston
2002 land value = $1342
Cotton

8



1910: Sumter = $13; Houston = $17; Madison = $21 (Madison never fell in 80's)

Annual Growth Rate

$$V_m = V_{m-1} * (1 + g_m)$$

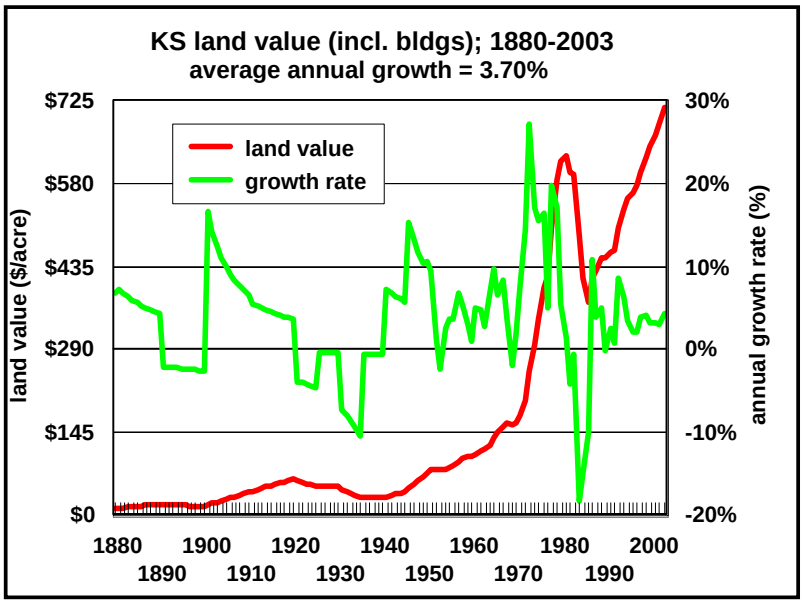
$$V_{2004} = V_{2003} * (1 + g_{2004})$$

$$= \$715 * (1.03) = \$736.45$$

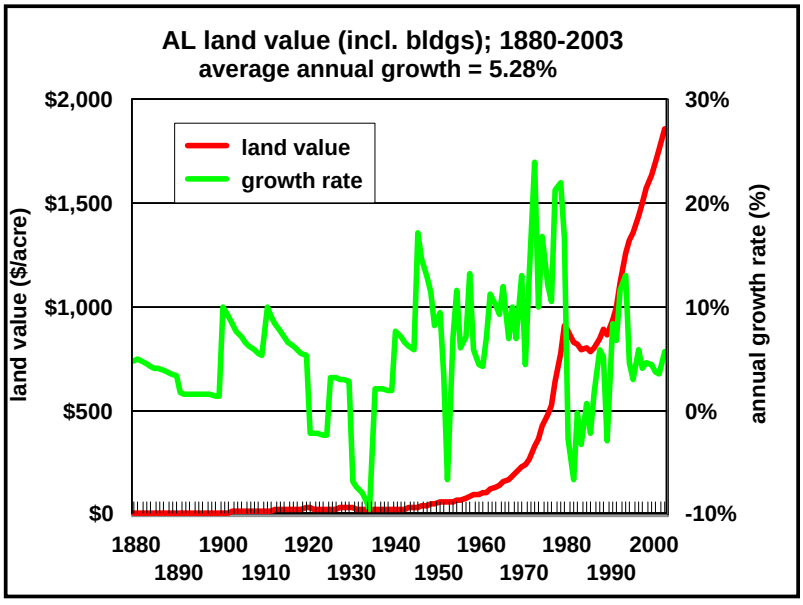
$$g_m = \frac{V_m}{V_{m-1}} - 1$$

$$g_{2003} = \frac{V_{2004}}{V_{2003}} - 1$$

$$= \frac{\$736.45}{\$715} - 1 = 0.03 = 3\%$$


KS land value (incl. bldgs); 1880-2003
average annual growth = 3.70%
land value
growth rate
land value ($/acre)
annual growth rate (%)
$725
$580
$435
$290
$145
$0
30%
20%
10%
0%
-10%
-20%
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

11


AL land value (incl. bldgs); 1880-2003
average annual growth = 5.28%
land value
growth rate
land value ($/acre)
annual growth rate (%)
$2,000
$1,500
$1,000
$500
$0
30%
20%
10%
0%
-10%
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

12

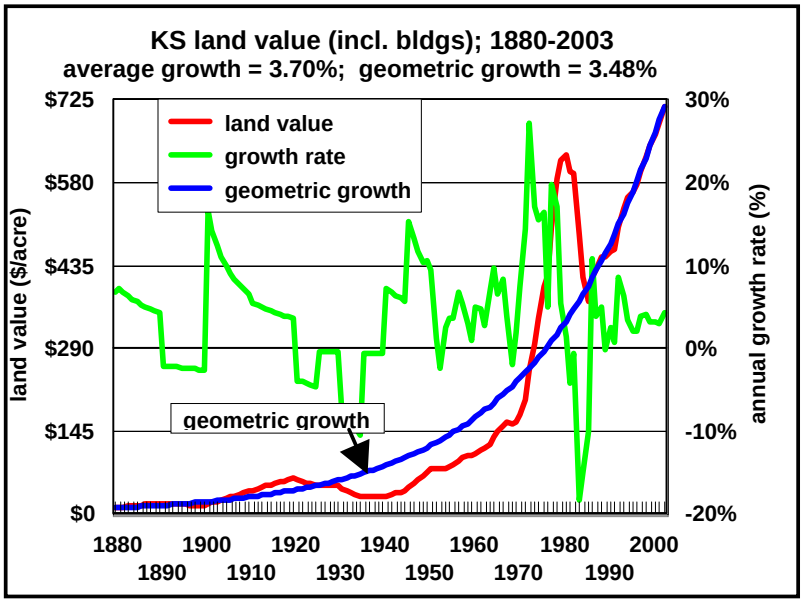
Historical Growth

$$average\ growth = \frac{1}{124} * \left(g_{1880} + g_{1881} +, ..., + g_{2003} \right)$$

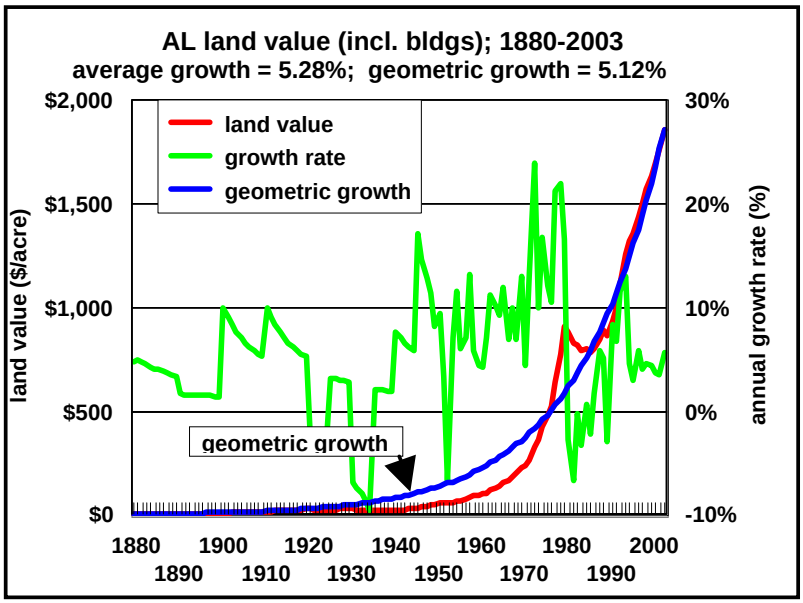
$$V_n = V_m * \left(1 + g\right)^{n-m}$$

$$geometric\ mean = g = \left(\frac{V_n}{V_m} \right)^{\left(\frac{1}{n-m} \right)} - 1$$

$$g = \left(\frac{V_{2003}}{V_{1879}} \right)^{\left(\frac{1}{2003-1879} \right)} - 1 = \left(\frac{\$715}{\$10.30} \right)^{\frac{1}{124}} - 1 = 0.0348$$

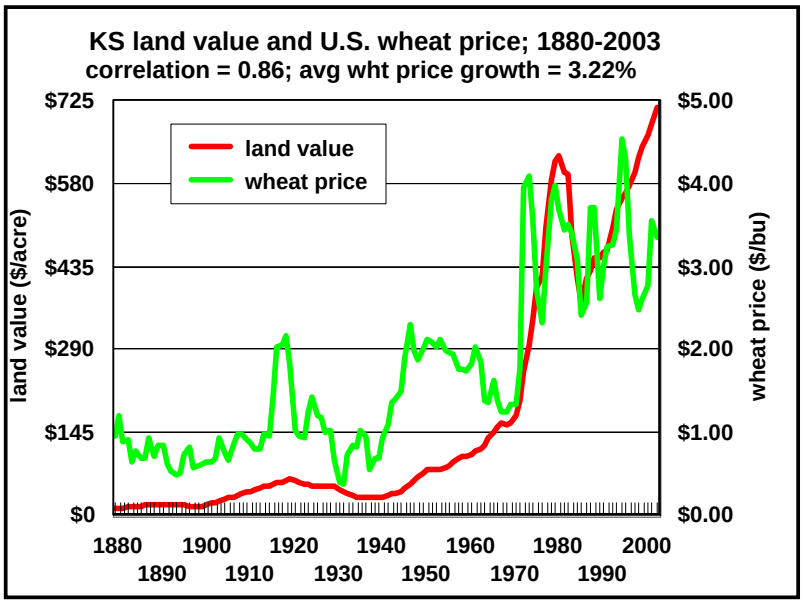


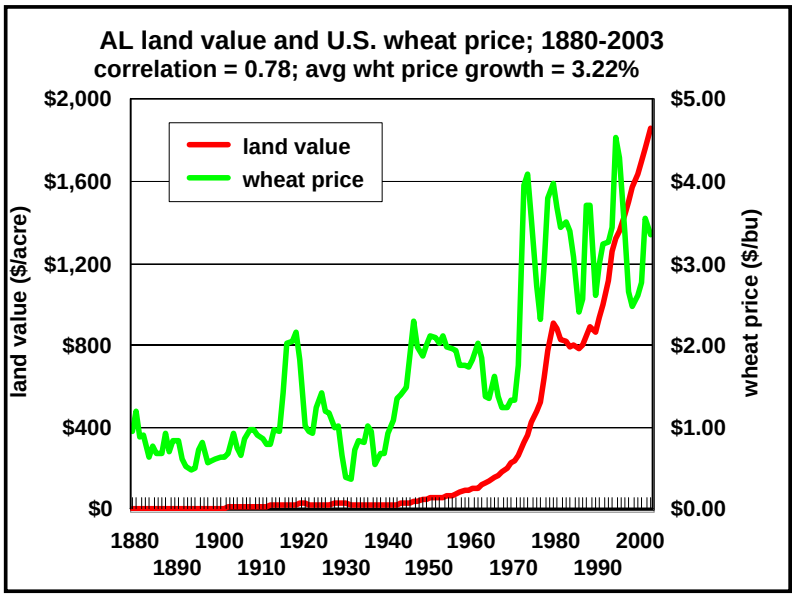
1879 starting land value for Kansas was $10.30

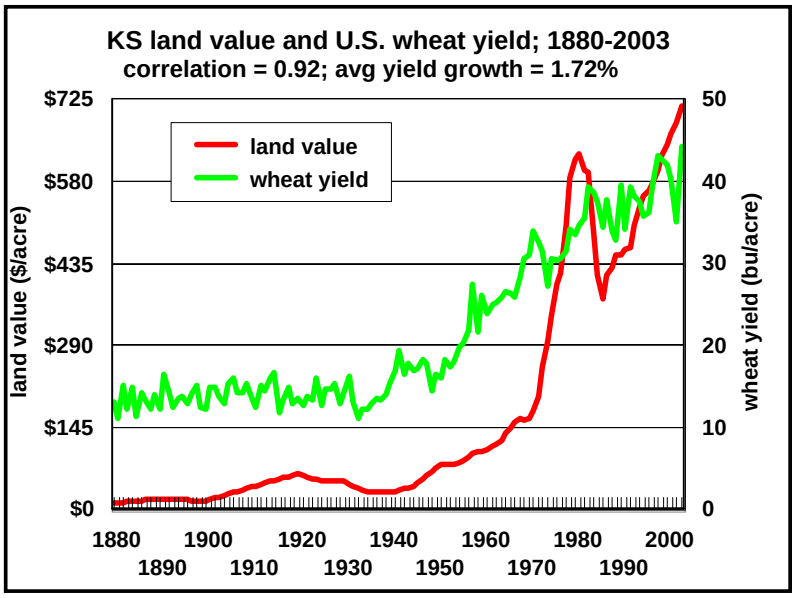


1879 starting land value for Alabama was $3.82

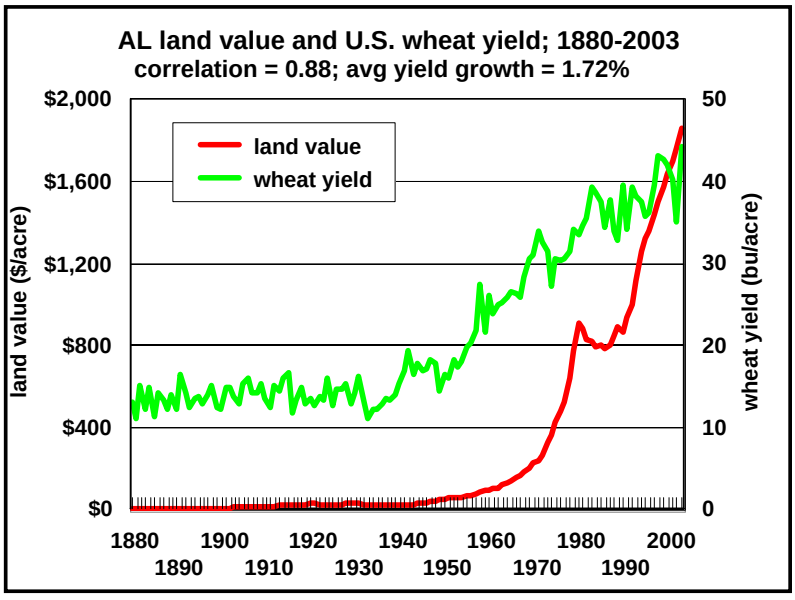
What drives land prices in the long run?


KS land value and U.S. wheat price; 1880-2003
correlation = 0.86; avg wht price growth = 3.22%
land value
wheat price
land value ($/acre)
wheat price ($/bu)
$725
$580
$435
$290
$145
$0
$5.00
$4.00
$3.00
$2.00
$1.00
$0.00
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

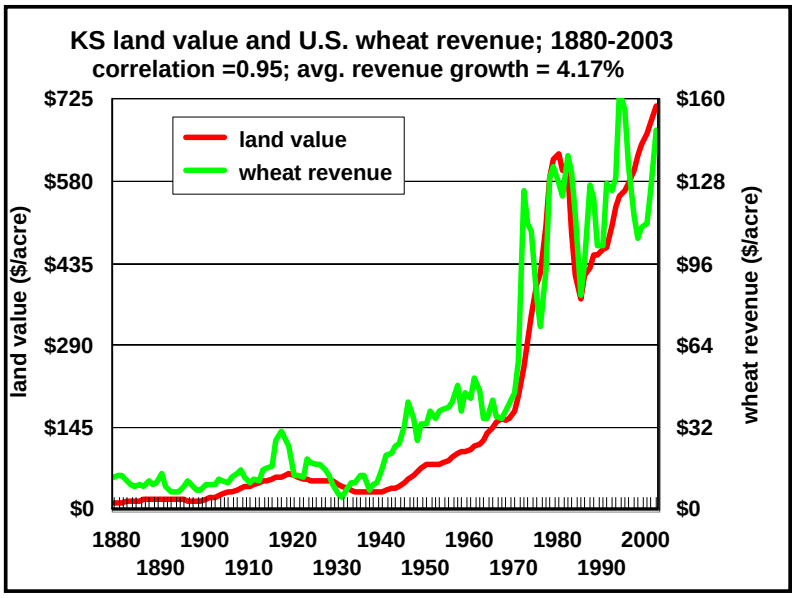

AL land value and U.S. wheat price; 1880-2003
correlation = 0.78; avg wht price growth = 3.22%
land value
wheat price
land value ($/acre)
wheat price ($/bu)
$2,000
$1,600
$1,200
$800
$400
$0
$5.00
$4.00
$3.00
$2.00
$1.00
$0.00
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000


KS land value and U.S. wheat yield; 1880-2003
correlation = 0.92; avg yield growth = 1.72%
land value
wheat yield
land value ($/acre)
wheat yield (bu/acre)
$725
$580
$435
$290
$145
$0
50
40
30
20
10
0
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

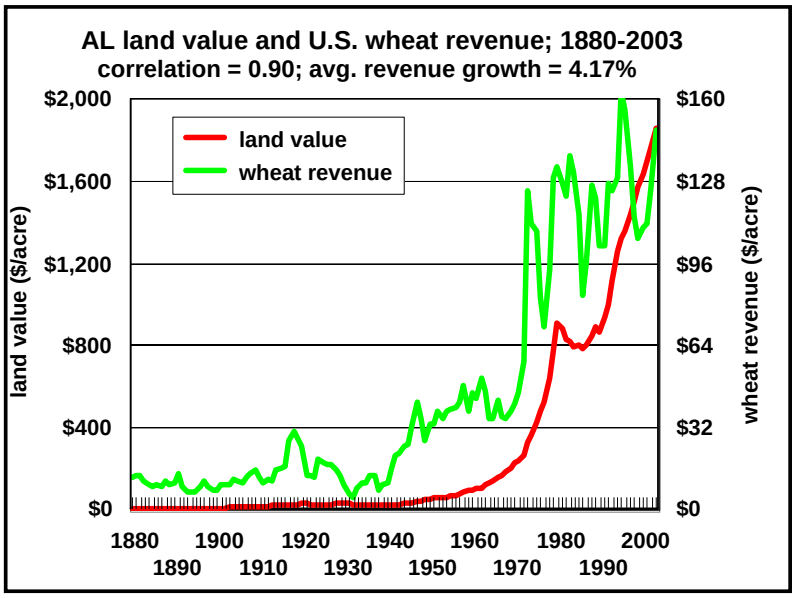
19


AL land value and U.S. wheat yield; 1880-2003
correlation = 0.88; avg yield growth = 1.72%
land value
wheat yield
land value ($/acre)
wheat yield (bu/acre)
$2,000
$1,600
$1,200
$800
$400
$0
50
40
30
20
10
0
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

20

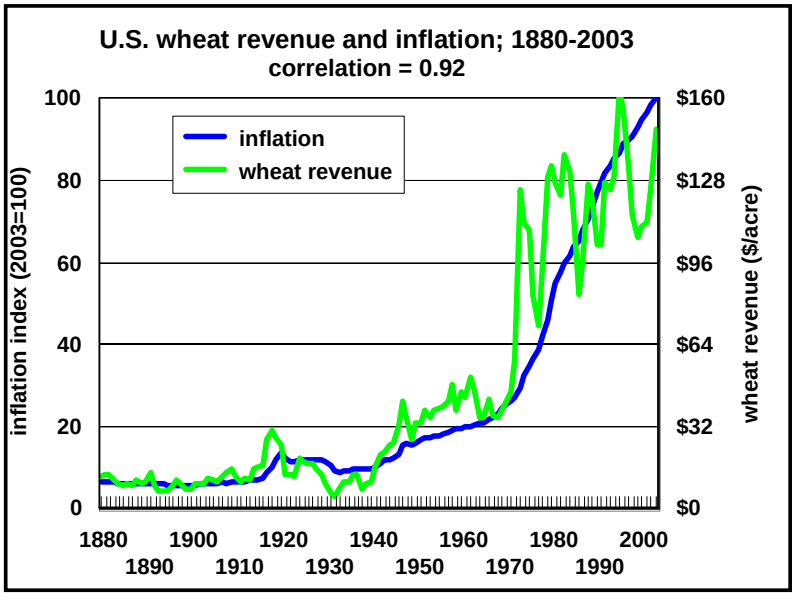

KS land value and U.S. wheat revenue; 1880-2003
correlation =0.95; avg. revenue growth = 4.17%
land value
wheat revenue
land value ($/acre)
wheat revenue ($/acre)
$725
$580
$435
$290
$145
$0
$160
$128
$96
$64
$32
$0
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

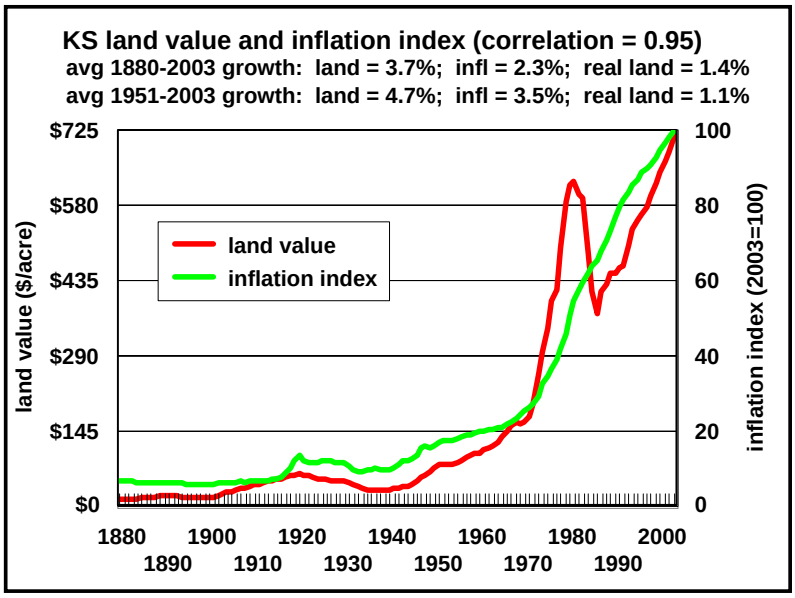
21


AL land value and U.S. wheat revenue; 1880-2003
correlation = 0.90; avg. revenue growth = 4.17%
land value
wheat revenue
land value ($/acre)
wheat revenue ($/acre)
$2,000
$1,600
$1,200
$800
$400
$0
$160
$128
$96
$64
$32
$0
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

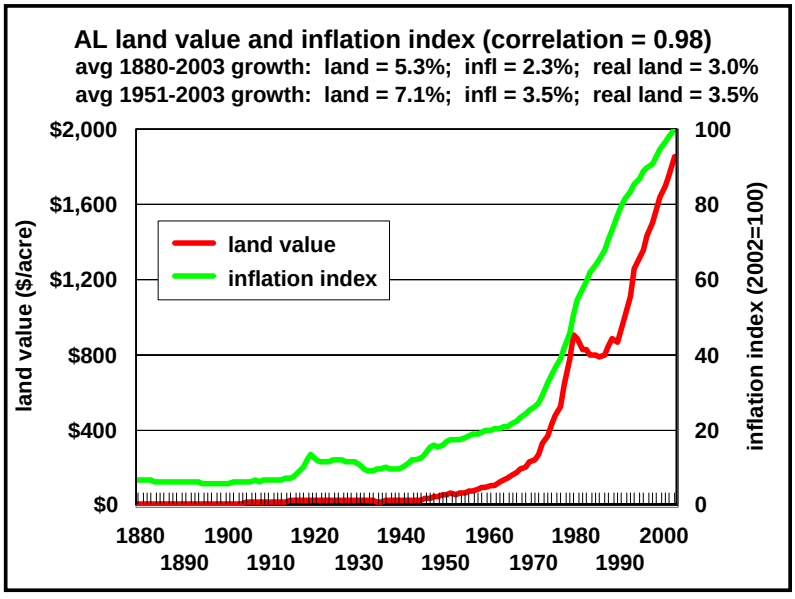
22

But, what drives crop revenue?

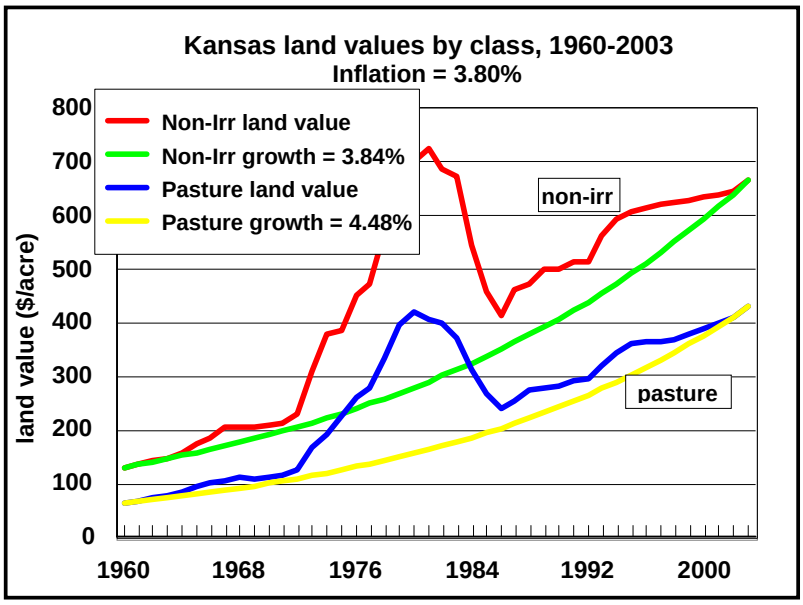



KS land value and inflation index (correlation = 0.95)
avg 1880-2003 growth: land = 3.7%; infl = 2.3%; real land = 1.4%
avg 1951-2003 growth: land = 4.7%; infl = 3.5%; real land = 1.1%
land value ($/acre)
$725
$580
$435
$290
$145
$0
inflation index (2003=100)
100
80
60
40
20
0
land value
inflation index
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

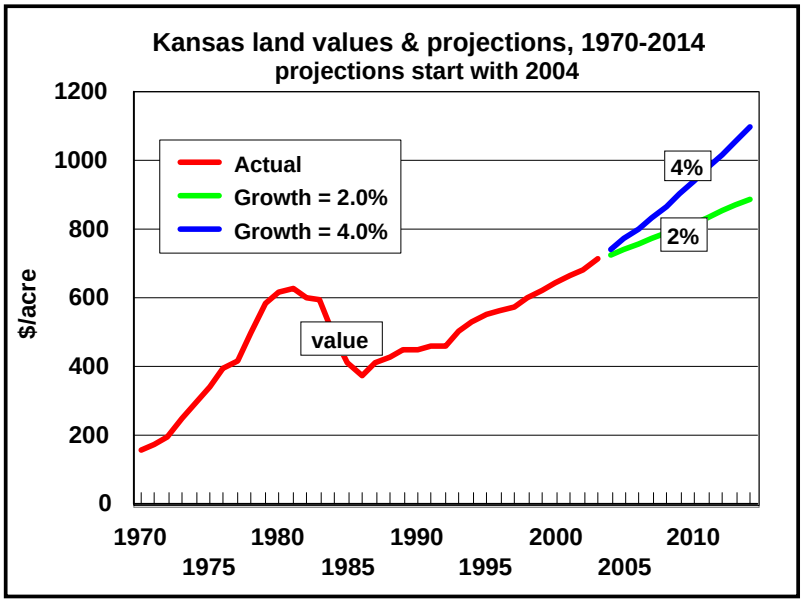
25


AL land value and inflation index (correlation = 0.98)
avg 1880-2003 growth: land = 5.3%; infl = 2.3%; real land = 3.0%
avg 1951-2003 growth: land = 7.1%; infl = 3.5%; real land = 3.5%
land value ($/acre)
$2,000
$1,600
$1,200
$800
$400
$0
inflation index (2002=100)
100
80
60
40
20
0
land value
inflation index
1880
1890
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

26


Kansas land values by class, 1960-2003
Inflation = 3.80%
Non-Irr land value
Non-Irr growth = 3.84%
Pasture land value
Pasture growth = 4.48%
non-irr
pasture
land value ($/acre)
800
700
600
500
400
300
200
100
0
1960
1968
1976
1984
1992
2000

27


Kansas land values & projections, 1970-2014
projections start with 2004
Actual
Growth = 2.0%
Growth = 4.0%
4%
2%
value
$/acre
1200
1000
800
600
400
200
0
1970
1975
1980
1985
1990
1995
2000
2005
2010

28

Returns to land

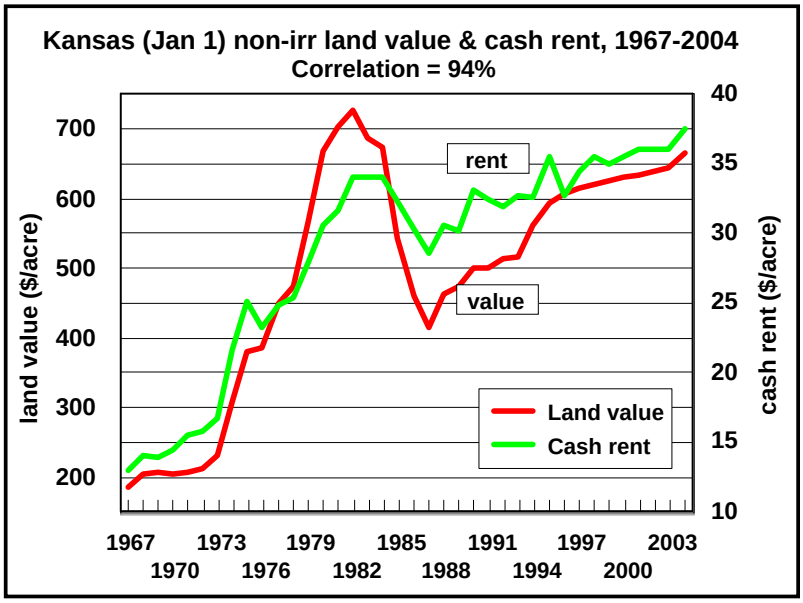
Returns to land

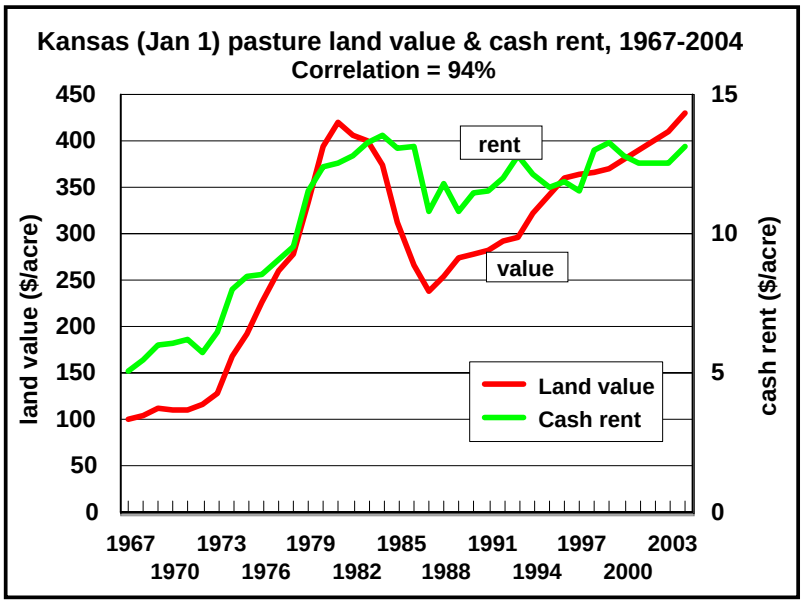
- Capital gains (growth)
- Cash returns (rent)

- The two returns to land are similar to other investments such as the stock market (capital gains and dividends)

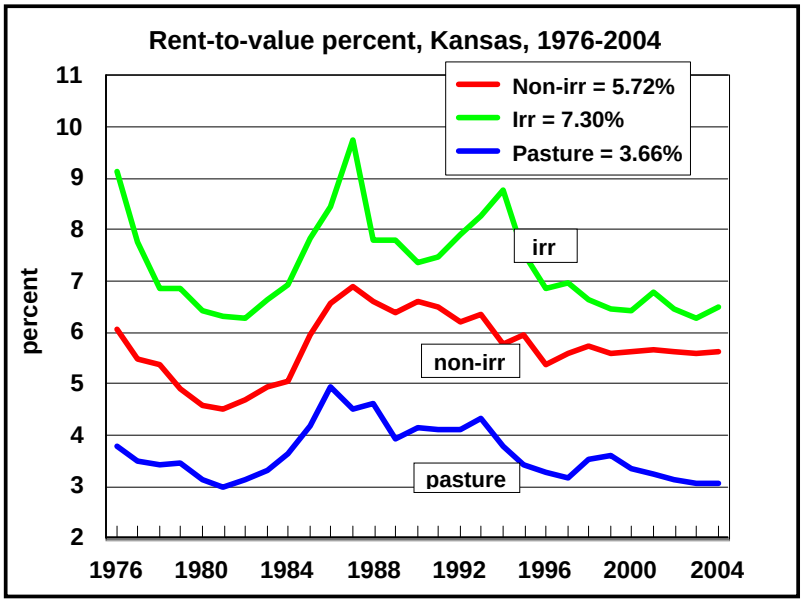
Rent

- KFMA farms with > 100 crop acres (2001-2003 avg)
  - 89% of KFMA farms use rented crop land (range across six regions, 85%-94%)
  - 63% of crop acres farmed by KFMA members are rented (range across six regions, 58%-72%)
- For owner-operators rent is the "profit" assigned to land after all other opportunity costs are considered




Kansas (Jan 1) pasture land value & cash rent, 1967-2004
Correlation = 94%
land value ($/acre)
cash rent ($/acre)
450
400
350
300
250
200
150
100
50
0
15
10
5
0
rent
value
Land value
Cash rent
1967
1970
1973
1976
1979
1982
1985
1988
1991
1994
1997
2000
2003

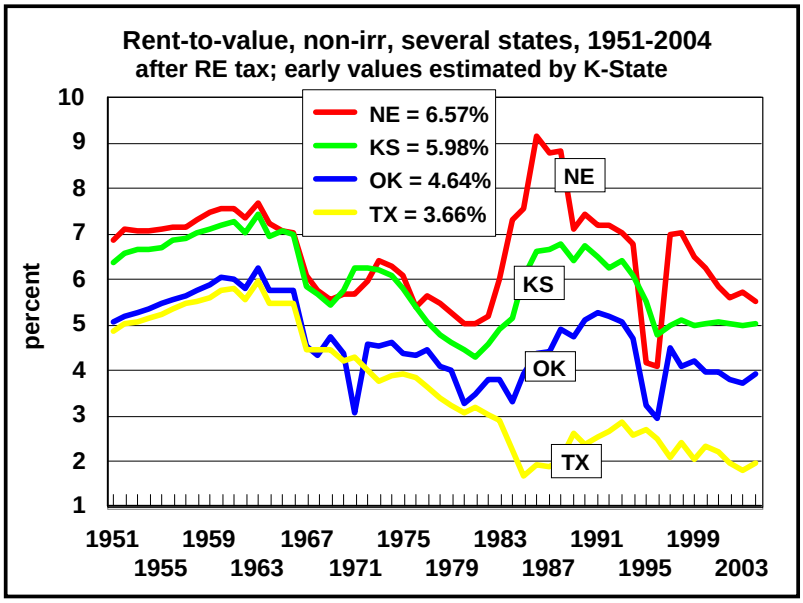
33


Rent-to-value percent, Kansas, 1976-2004
percent
11
10
9
8
7
6
5
4
3
2
Non-irr = 5.72%
Irr = 7.30%
Pasture = 3.66%
irr
non-irr
pasture
1976
1980
1984
1988
1992
1996
2000
2004

34

Why are Rents Lower on Pasture than on Farmland?

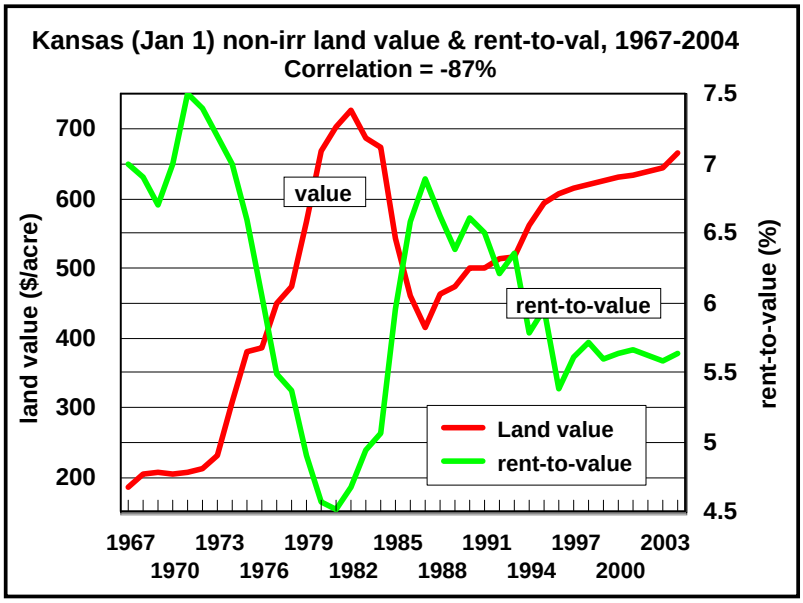
- People just love cows and pasture
- Security more important in cattle production
- Imperfect markets/sticky prices
  - share rents would adjust to technology faster
  - share rents would keep cash rents in line
  - little share renting in pasture
  - landlord management small (tenant power)
- Less desirable pastures are rented
  - size, shape, location, grass quality, water, fences



Capitalization Formula

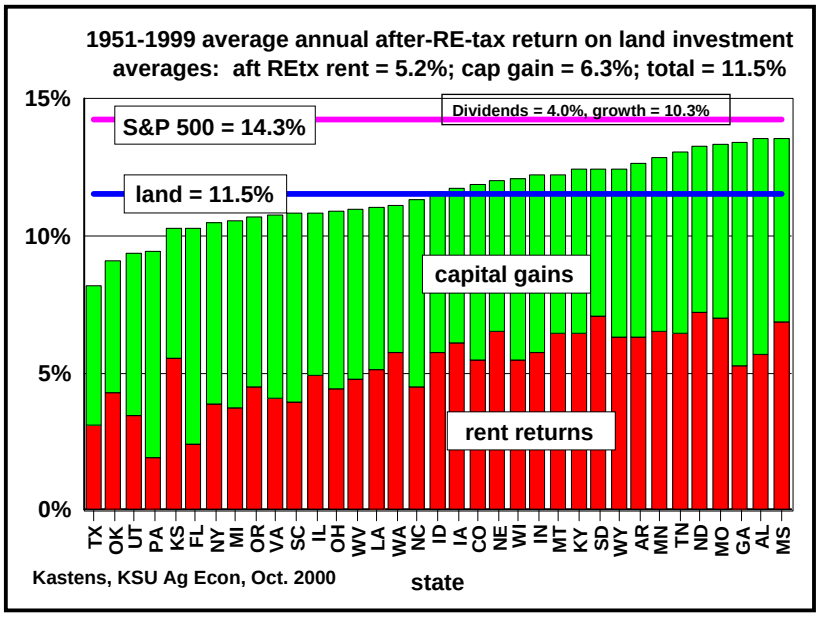
$$Value = \frac{Annual\ land\ income}{Capitalization\ rate}$$

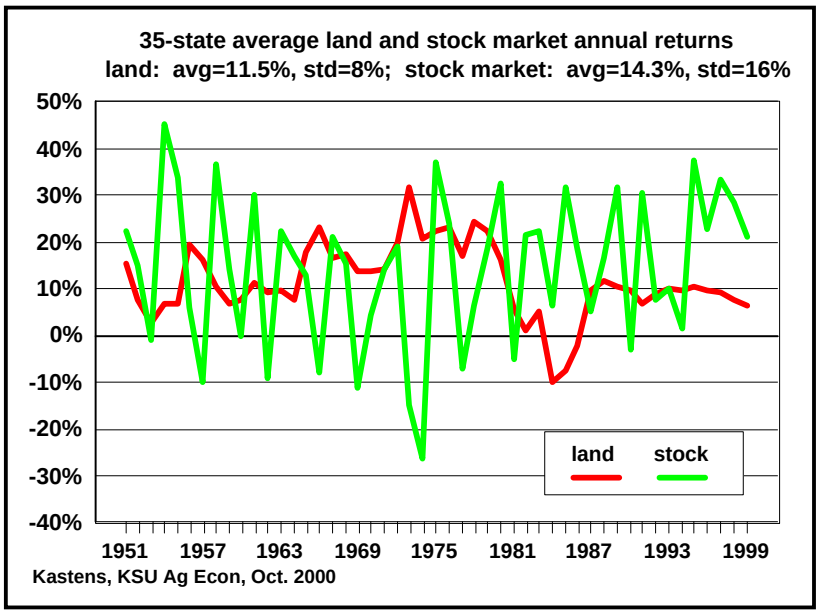
$$Cap\ rate\ (rtv) = \frac{Annual\ land\ income}{Value}$$



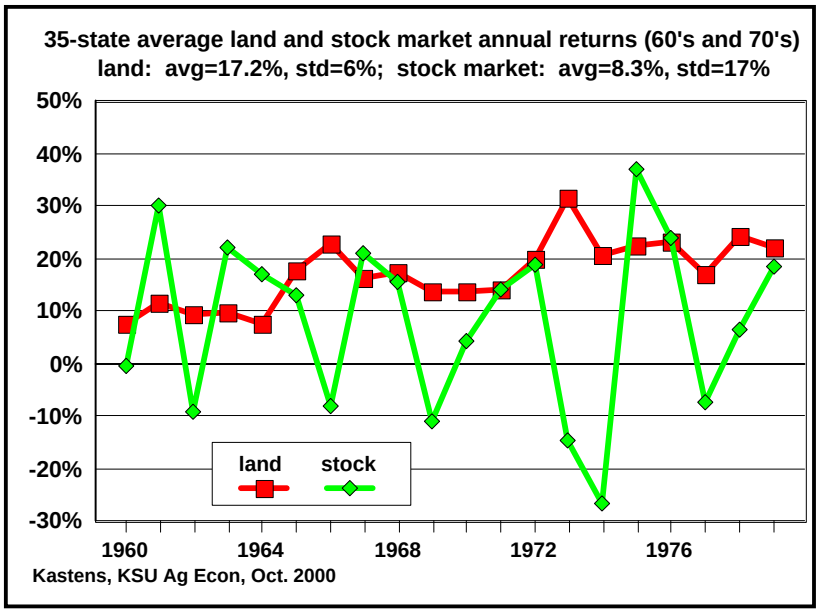
Returns to Land

- **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"**




35-state average land and stock market annual returns
land: avg=11.5%, std=8%; stock market: avg=14.3%, std=16%
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
-40%
1951
1957
1963
1969
1975
1981
1987
1993
1999
land
stock
Kastens, KSU Ag Econ, Oct. 2000

41


35-state average land and stock market annual returns (60's and 70's)
land: avg=17.2%, std=6%; stock market: avg=8.3%, std=17%
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
1960
1964
1968
1972
1976
land
stock
Kastens, KSU Ag Econ, Oct. 2000

42

Combining Land & Stock Investments

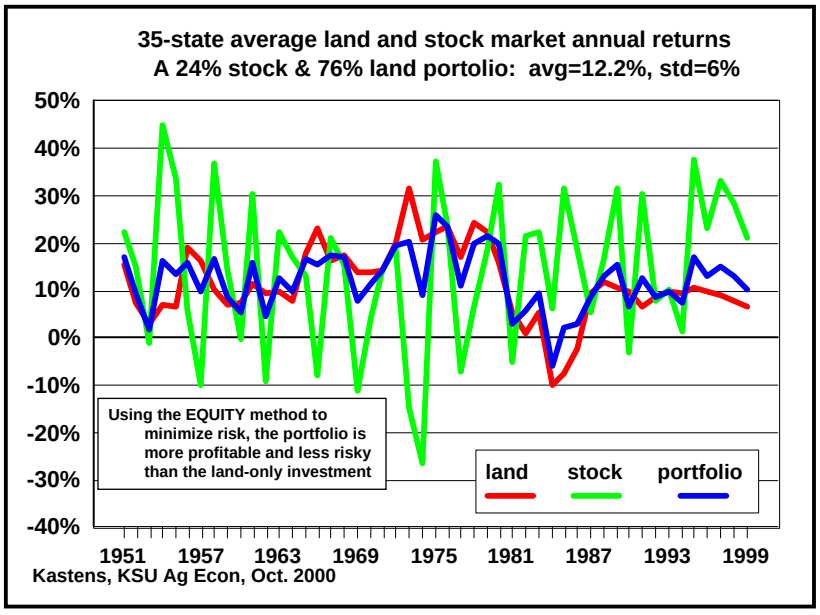
- **Profitability**
  - Stock returns > land returns in long periods
- **Risk**
  - By itself stock is riskier than land
  - Less risky in a portfolio setting
    - Stock and land returns are negatively correlated (-0.25)
    - Does NOT depend on negative correlation
- **Land/stock portfolio**
  - Profits (returns) are a linear blend of land-alone and stock-alone investments
  - Risk falls then rises with increased stock
  - Investor chooses desired risk/reward combination

Two ways to add stock to farm investments

- **Debt**
  - Farm borrows money to buy stock and pays interest on borrowed money. For every $1 of farm equity, farm borrows $H and pays interest at the rate of I, so that portfolio returns are:
    - Pd = F + H(S – I)
- **Equity**
  - Farm uses farm equity (sells assets) to purchase stock. Where K is the portion of a farm's equity that is converted to stock investment (0<=K<=1):
    - Pe = (1 – K)F + KS

Buying stock with debt or equity

- **Debt**
  - Negative correlation is often needed for portfolio risk to be lower than risk for farm-only or stock-only investments
  - Can a farm borrow the money required?
  - Tradeoff between debt-induced risk and portfolio risk reduction
  - Is stock investment the best use of excess borrowing capacity?
- **Equity**
  - Should a farm downsize to buy stock?
  - Can a farm sell farm assets and rent them back, to free up equity for stock purchase without downsizing?

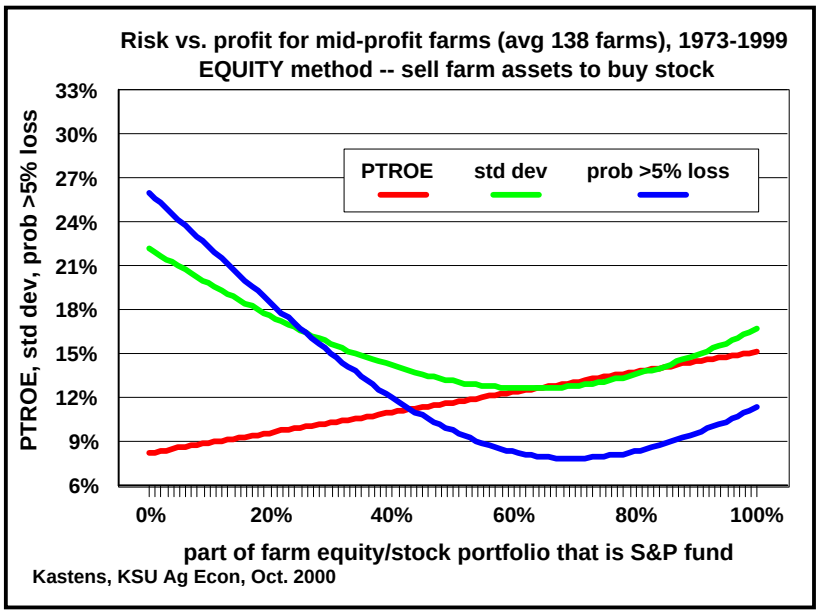


Land returns vs. farm returns

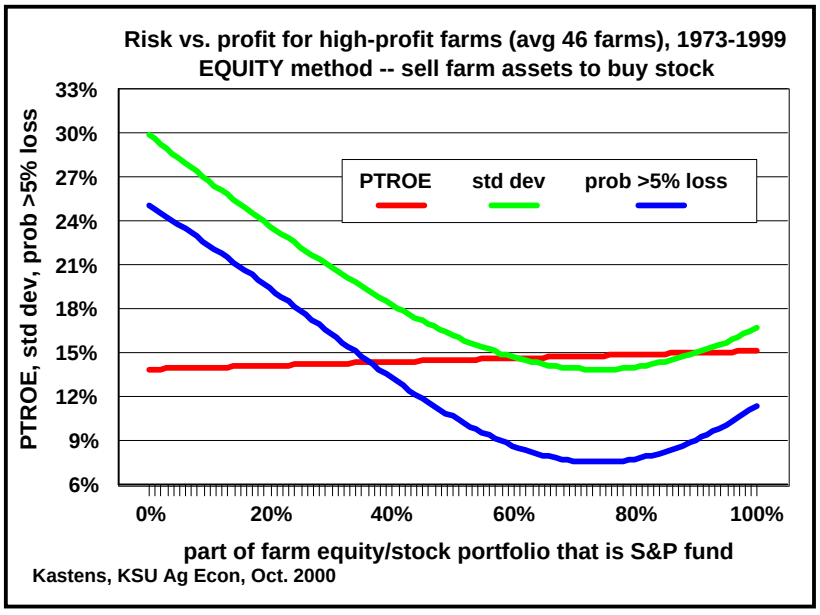
- Kansas Farm Management Associations
  - 2,000+ farms per year 1973 – 1999
    - Less farms if require multi-year presence
  - Calculated an after-tax ROE, ATROE
  - Converted ATROE to pre-tax according to:
    PTROE = ATROE/(1 – 0.35)
- Kansas farm returns are compared to Kansas land returns and to the S&P

1973-1999 annual returns

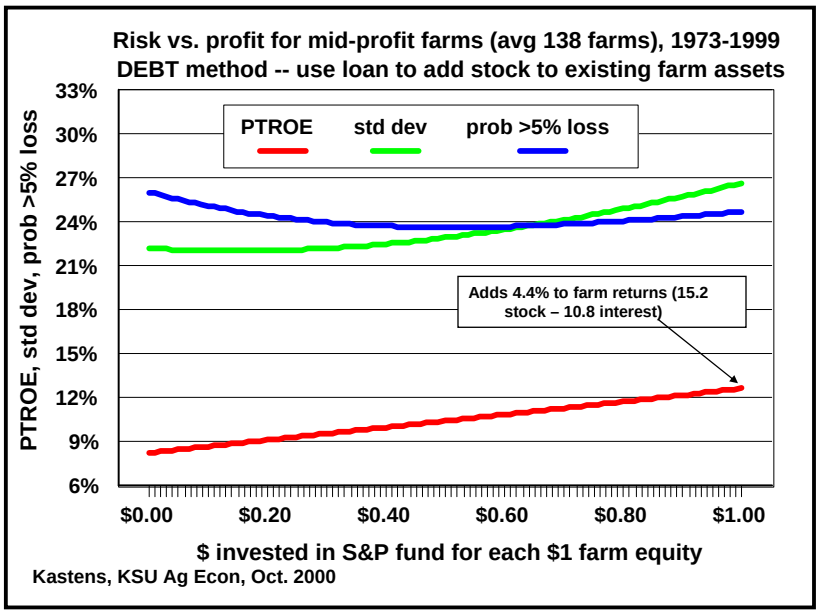
- S&P fund
  15.2% avg and 16.7% std
- Land portfolio
  10.1% avg and 10.7% std
- Portfolio of average farms (138 farms)
  8.3% avg and 10.5% std
- Portfolio of “top-third” farms (46 farms)
  13.9% avg and 14.8% std
- Portfolios of farms, or land, or stock have lower risk than individual farms, parcels, or stocks


Risk vs. profit for mid-profit farms (avg 138 farms), 1973-1999
EQUITY method -- sell farm assets to buy stock
PTROE, std dev, prob >5% loss
33%
30%
27%
24%
21%
18%
15%
12%
9%
6%
PTROE
std dev
prob >5% loss
0%
20%
40%
60%
80%
100%
part of farm equity/stock portfolio that is S&P fund
Kastens, KSU Ag Econ, Oct. 2000

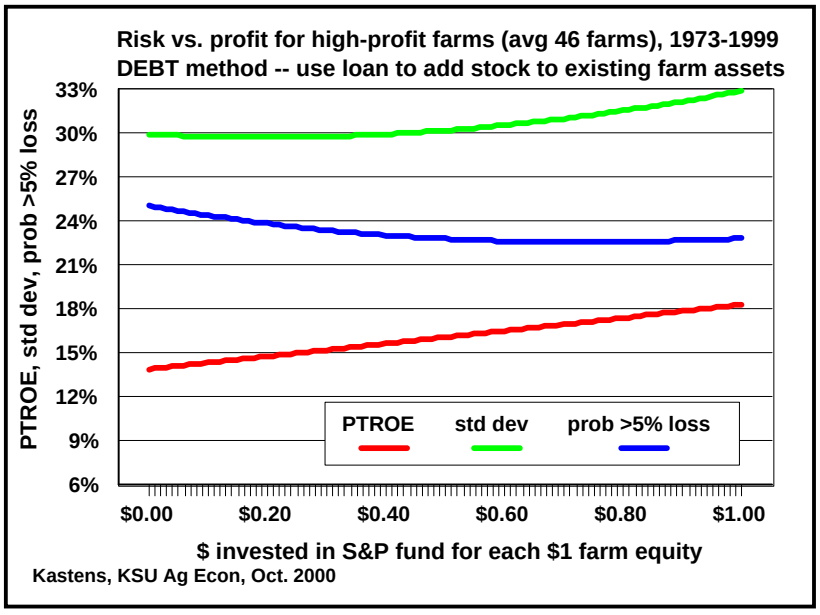
49


Risk vs. profit for high-profit farms (avg 46 farms), 1973-1999
EQUITY method -- sell farm assets to buy stock
PTROE, std dev, prob >5% loss
33%
30%
27%
24%
21%
18%
15%
12%
9%
6%
PTROE
std dev
prob >5% loss
0%
20%
40%
60%
80%
100%
part of farm equity/stock portfolio that is S&P fund
Kastens, KSU Ag Econ, Oct. 2000

50


Risk vs. profit for mid-profit farms (avg 138 farms), 1973-1999
DEBT method -- use loan to add stock to existing farm assets
PTROE, std dev, prob >5% loss
33%
30%
27%
24%
21%
18%
15%
12%
9%
6%
PTROE
std dev
prob >5% loss
Adds 4.4% to farm returns (15.2 stock – 10.8 interest)
$0.00
$0.20
$0.40
$0.60
$0.80
$1.00
$ invested in S&P fund for each $1 farm equity
Kastens, KSU Ag Econ, Oct. 2000

51


Risk vs. profit for high-profit farms (avg 46 farms), 1973-1999
DEBT method -- use loan to add stock to existing farm assets
PTROE, std dev, prob >5% loss
33%
30%
27%
24%
21%
18%
15%
12%
9%
6%
PTROE
std dev
prob >5% loss
$0.00
$0.20
$0.40
$0.60
$0.80
$1.00
$ invested in S&P fund for each $1 farm equity
Kastens, KSU Ag Econ, Oct. 2000

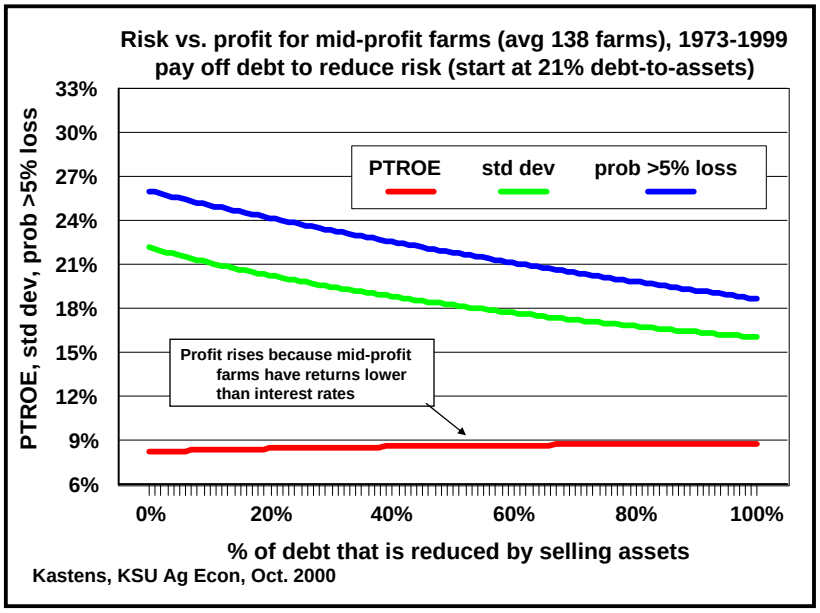
52

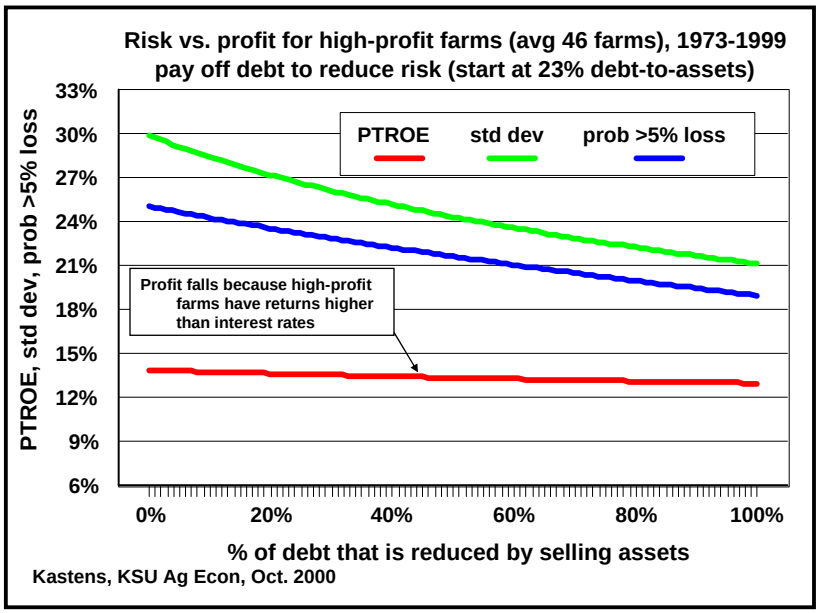
Using debt to purchase stock

- Considerations:
  - 1. Stock purchase doesn't reduce risk much
  - 2. Are stock returns higher than farm returns?
  - 3. Are stock returns higher than interest rates?
  - 4. Does farm have excess borrowing capacity?
    - Leverage ratio increases with increased stock purchase
  - 5. Is this the best thing to do with excess borrowing capacity?
    - Costs might fall with a farm expansion?
  - 6. Servicing debt wouldn't be hard (sell shares)

Using equity to purchase stock

- Considerations:
  - 1. Are stock returns higher than farm returns?
  - 2. Will downsizing the farm hurt profitability?
  - 3. Can you do this without downsizing?
    - Sell capital assets and rent back
    - Bring in off-farm or outside equity capital
  - 4. Stock purchase reduces risk substantially
  - 5. Is this the best way to reduce risk?
    - If goal is to reduce risk could pay down debt instead


Risk vs. profit for mid-profit farms (avg 138 farms), 1973-1999
pay off debt to reduce risk (start at 21% debt-to-assets)
PTROE, std dev, prob >5% loss
33%
30%
27%
24%
21%
18%
15%
12%
9%
6%
PTROE
std dev
prob >5% loss
Profit rises because mid-profit farms have returns lower than interest rates
0%
20%
40%
60%
80%
100%
% of debt that is reduced by selling assets
Kastens, KSU Ag Econ, Oct. 2000


Risk vs. profit for high-profit farms (avg 46 farms), 1973-1999
pay off debt to reduce risk (start at 23% debt-to-assets)
PTROE, std dev, prob >5% loss
33%
30%
27%
24%
21%
18%
15%
12%
9%
6%
PTROE
std dev
prob >5% loss
Profit falls because high-profit farms have returns higher than interest rates
0%
20%
40%
60%
80%
100%
% of debt that is reduced by selling assets
Kastens, KSU Ag Econ, Oct. 2000

Revisiting risk & profit & stock purchase

- Risk and stock ownership:
  - To reduce risk, leveraged farms might just as well sell assets and reduce debt as buy stock
- Profitability & stock ownership & farm size
  - Work at K-State suggests profits are $0.15 to $0.22/acre higher for each 1% a farm is larger than its regional cohorts (after accounting for other management factors)

Who is most likely to buy stock?

- Low- to mid-profit farms with little to no debt
  - Use equity to buy stock:
    - If had debt probably would pay on it first because risk & profit similar across debt reduction & stock
  - Use debt to buy stock:
    - No-debt farms could take on added risk of debt
  - Often, the above farms are hobby/lifestyle farms
  - Retired farmers (landlords)
    - Can't capture the EOS of farming
    - Want more liquid assets in retirement

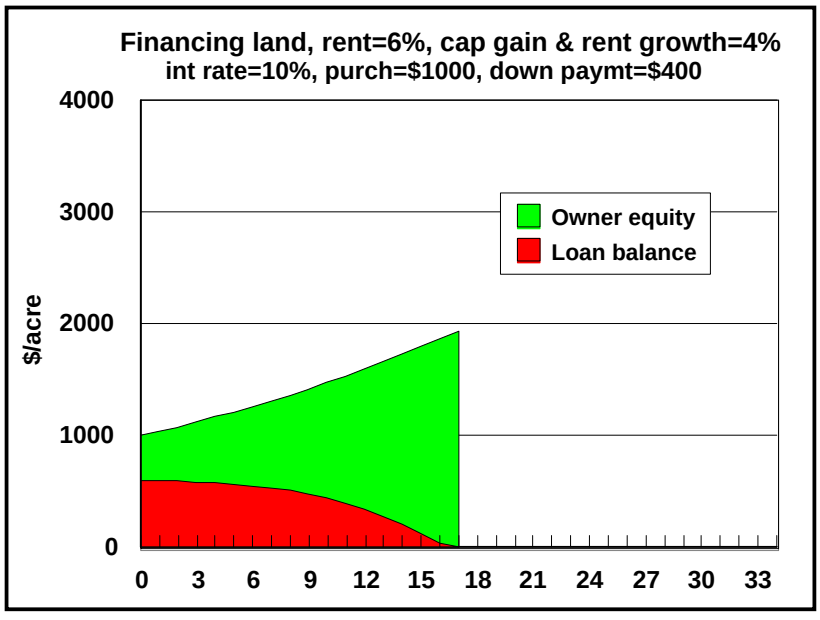
Final comments

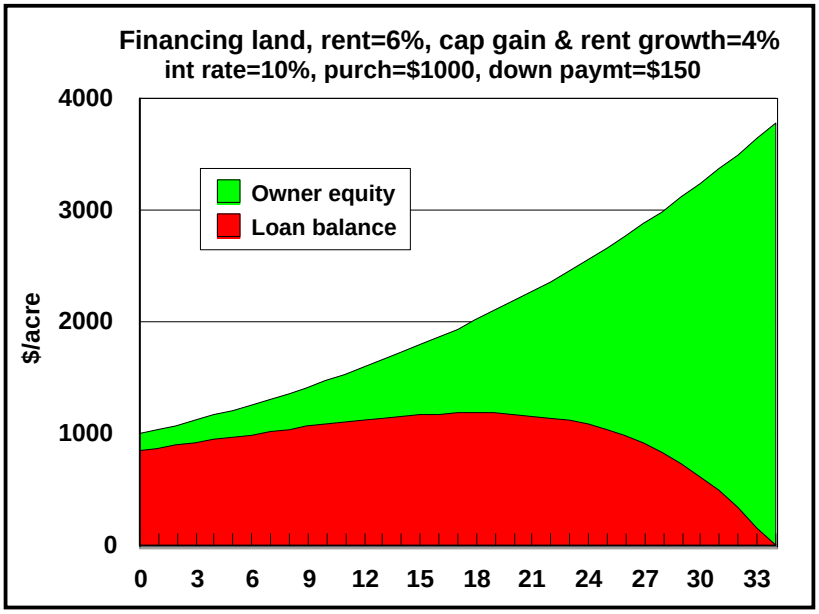
- Stock investment is a long run decision
  - Will my historical analysis bear out?
- Will an individual stock purchase capture any “excessive” profits involved?
  - Am I too late; is the risk acceptable?
- Think carefully about economies of size
  - Am I a good manager?
- Is stock purchase part of a short-run or long-run goal to exit farming
- Often comes down to
  - Will the market allow me to be a full-time farmer?
  - Do I want to be a full-time farmer?

Background for *KSU-Landbuy*

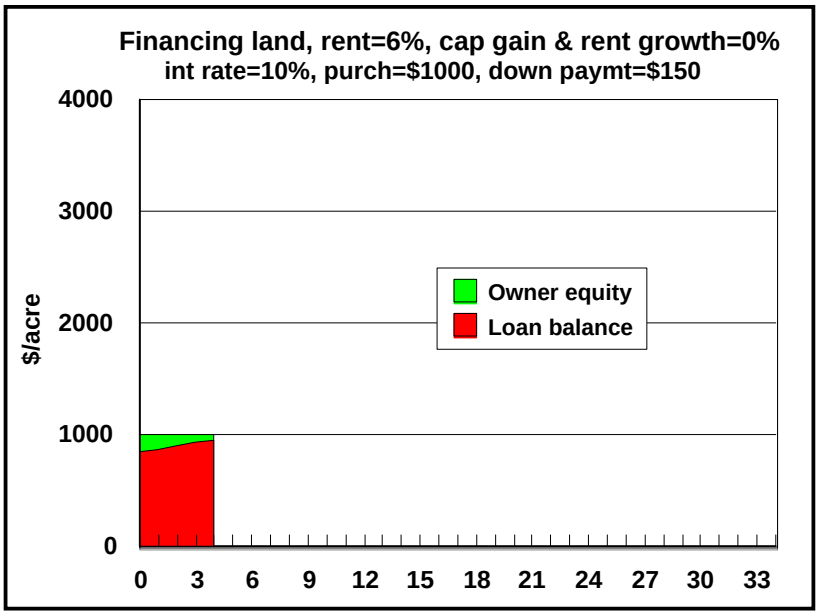
Buying and owning land – ideas

- Total return = rent + capital gain
- Land doesn't cash flow when purchased
  - i.e, rents don't cover a 100% loan
- Cash flow is not the same as profitability
- Rents grow, loan payments don't
  - land eventually cash flows
- Income tax and capital gains tax rates matter




Financing land, rent=6%, cap gain & rent growth=4%
int rate=10%, purch=$1000, down paymt=$150
$/acre
4000
3000
2000
1000
0
Owner equity
Loan balance
0 3 6 9 12 15 18 21 24 27 30 33

63


Financing land, rent=6%, cap gain & rent growth=0%
int rate=10%, purch=$1000, down paymt=$150
$/acre
4000
3000
2000
1000
0
Owner equity
Loan balance
0 3 6 9 12 15 18 21 24 27 30 33

64

Time Value of Money

- **$1 received today can earn interest:**

$$V_n = V_0 * (1+i)^n$$

$$V_3 = V_0 * (1+i)^3 = \$1 * 1.08 * 1.08 * 1.08 = \$1.26$$

- **$1 received in the future is worth less today:**

$$V_0 = \frac{V_n}{(1+i)^n}$$

$$V_0 = \frac{V_3}{(1+i)^3} = \frac{\$1}{1.08^3} = \$0.79$$

- **Today's value of a stream of future rents:**

$$PVR = \frac{R_1}{(1+i)^1} + \frac{R_2}{(1+i)^2} +, \ldots, + \frac{R_T}{(1+i)^T}$$

- **Future rents based on growing today's rent:**

$$PVR = \frac{R_0 * (1+g)^1}{(1+i)^1} + \frac{R_0 * (1+g)^2}{(1+i)^2} +, \ldots, + \frac{R_0 * (1+g)^T}{(1+i)^T}$$

- **Rents need adjusted for property tax and income tax; interest rate needs adjusted for income tax:**

$$PVR = \frac{(R_0 - Ptx_0) * (1-Itx) * (1+g)^1}{[1+i*(1-Itx)]^1} + \frac{(R_0 - Ptx_0) * (1-Itx) * (1+g)^2}{[1+i*(1-Itx)]^2} +, \ldots,$$
$$+ \frac{(R_0 - Ptx_0) * (1-Itx) * (1+g)^T}{[1+i*(1-Itx)]^T}$$

- **Today's value of net future land sale:**

$$PVS = \frac{SP - Ctx * (SP - PP)}{[1 + i * (1 - Itx)]^T}$$

- **Future land value based on growing today's value:**

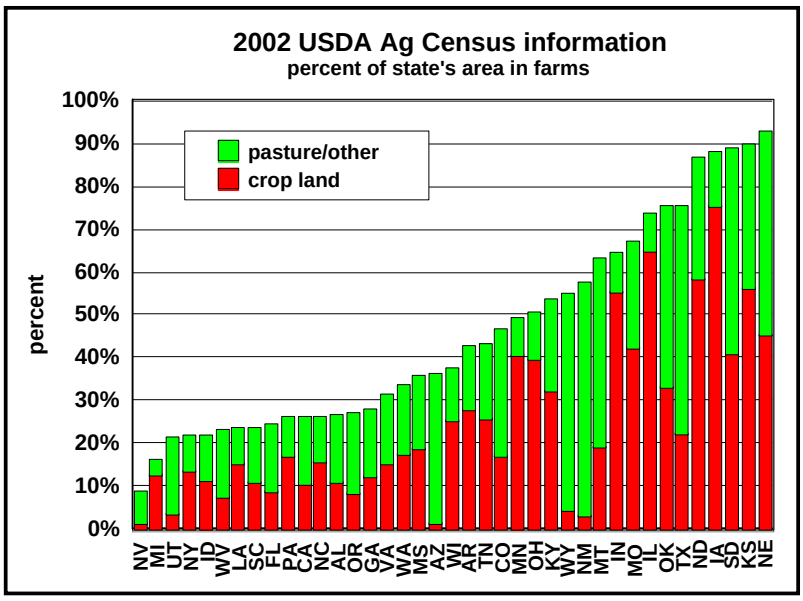
$$PVS = \frac{MV_0 * (1+g)^T - Ctx * [MV_0 * (1+g)^T - PP]}{[1 + i * (1 - Itx)]^T}$$

- **Total value of the land is today's value of the rent stream plus today's value of the future land sale:**

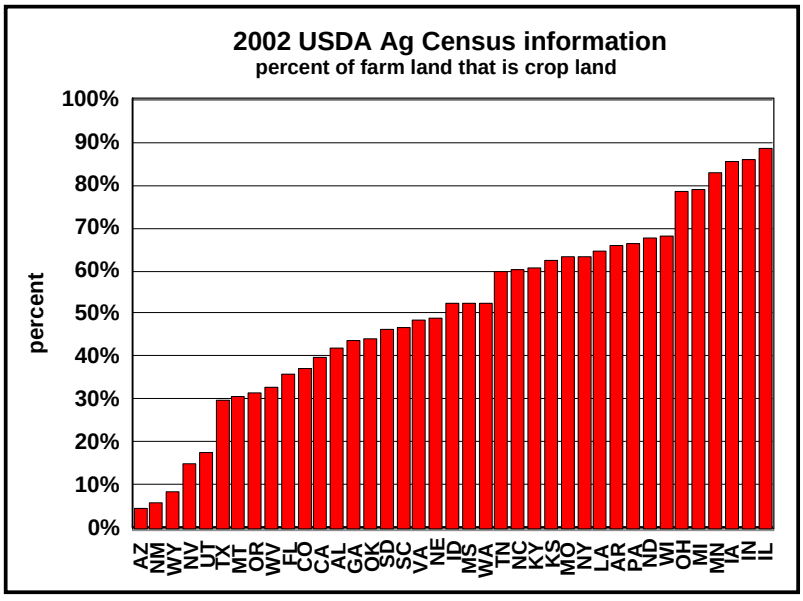
$$PVL = PVR + PVS$$

Non-ag Considerations

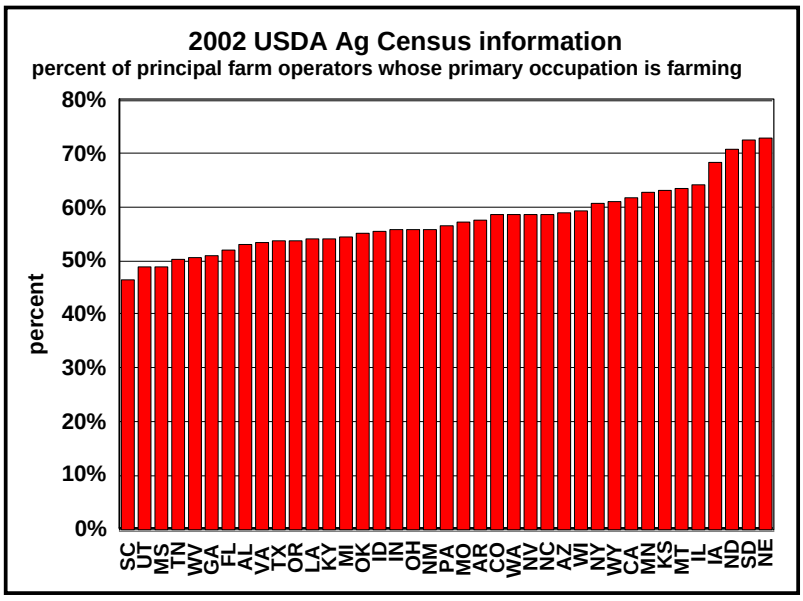
- **There could be a non-ag rent:**
  - **e.g., leasing your land to hunters**
- **There could be a non-ag land value growth:**
  - **e.g., expectations of future development**
- ***KSU-Landbuy.xls* allows for both**
- **But first some historical information**


2002 USDA Ag Census information
percent of state's area in farms
pasture/other
crop land
percent
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
NV MI UT NY ID WV LA SC FL PA CA NC AL OR GA VA WA MS AZ WI AR TN CO MN OH KY WY NM MT IN MO IL OK TX ND IA SD KS NE

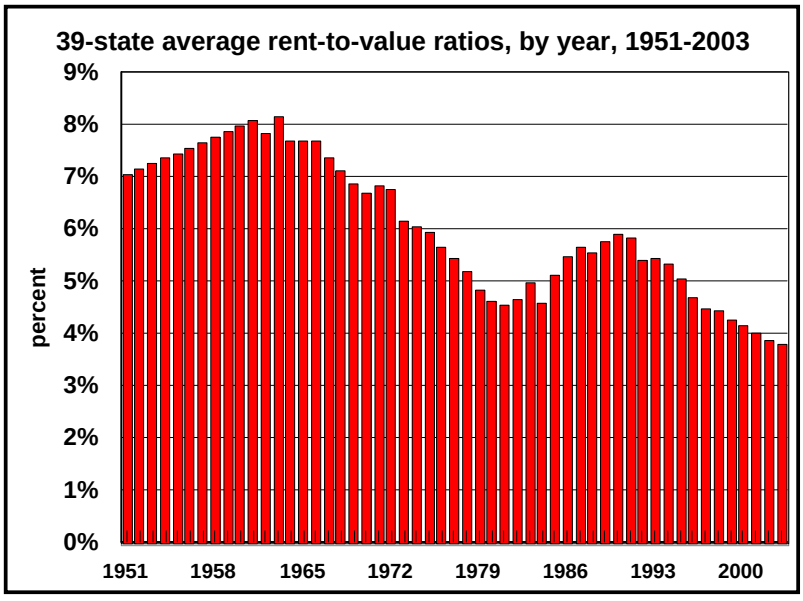
69


2002 USDA Ag Census information
percent of farm land that is crop land
percent
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
AZ NM WY NV UT TX MT OR WV FL CO CA AL GA OK SD SC VA NE ID MS WA TN NC KY KS MO NY LA AR PA ND WI OH MI MN IA IN IL

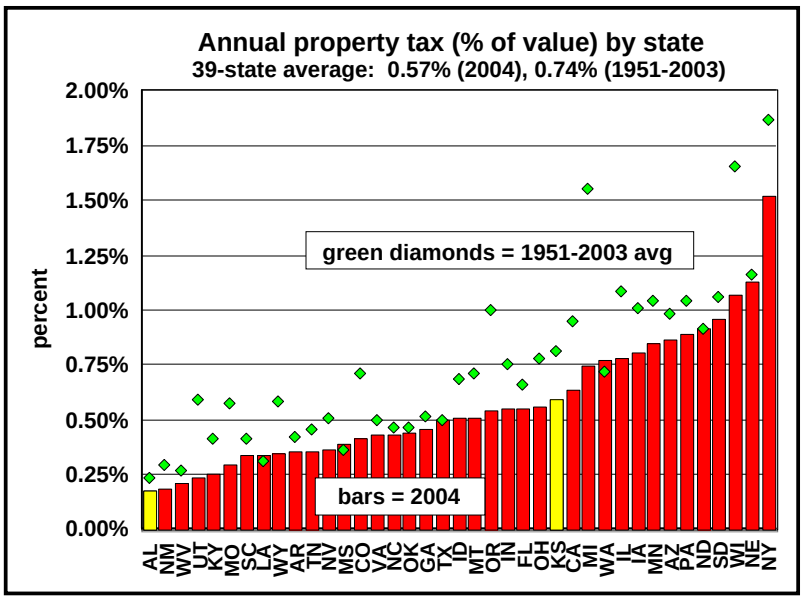
70

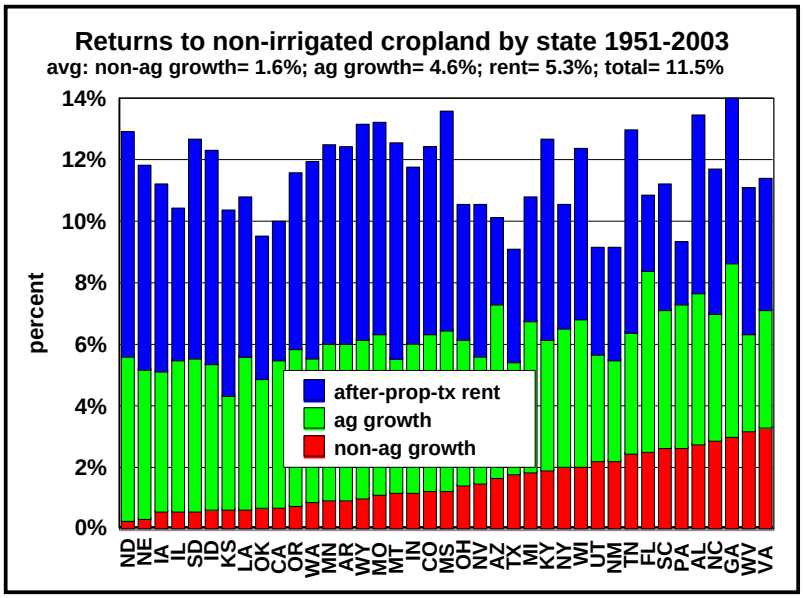

2002 USDA Ag Census information
percent of principal farm operators whose primary occupation is farming
percent
80%
70%
60%
50%
40%
30%
20%
10%
0%
SC UT MS TN WV GA FL AL VA TX OR LA KY MI OK ID IN OH NM PA MO AR CO WA NV NC AZ WI NY WY CA MN KS MT IL IA ND SD NE

71

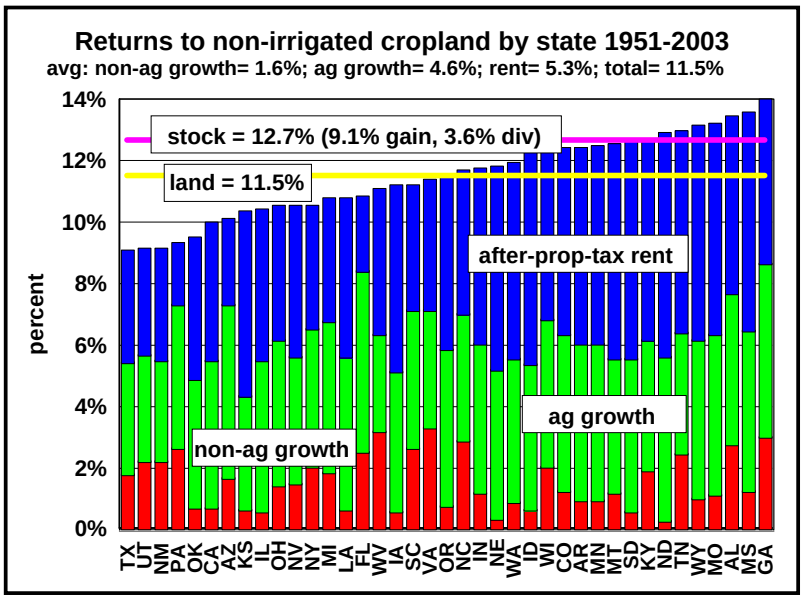

39-state average rent-to-value ratios, by year, 1951-2003
percent
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
1951
1958
1965
1972
1979
1986
1993
2000

72





39 states ranked by non-ag growth



39 states ranked by total returns to land

Agricultural Market Value of Agricultural Land

- Based on the idea of an ag cap rate
- Used average after-property-tax RTV 1951-72
  - Early on while ag still is dominant
  - Before wild inflation of the 1970's

- Alabama ag cap rate = 8.03%
- Kansas ag cap rate = 6.64%
- 39-state average cap rate = 6.56%

Agricultural Market Value of Agricultural Land using Alabama as an example

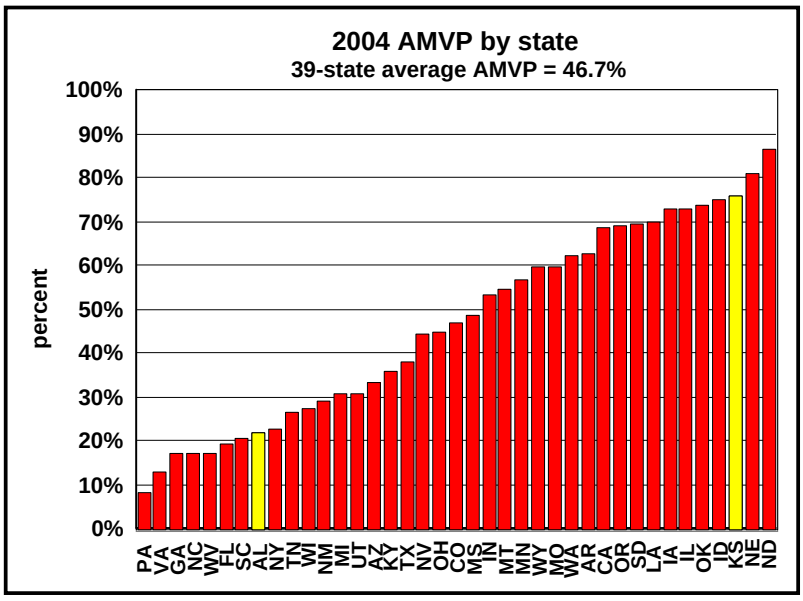
- Jan. 1, 2004 crop land value = $1800 /acre
- Cash rent for 2004 = $35 /acre
- 2004 property tax = $3.12 /acre
- 2004 after-property-tax rent = $31.88 /acre
- $31.88 / 0.0803 = $397 /acre

- AMVP = $397 / $1800 = 0.221 = 22.1%

Agricultural Market Value of Agricultural Land using KS non-irrigated cropland as an example

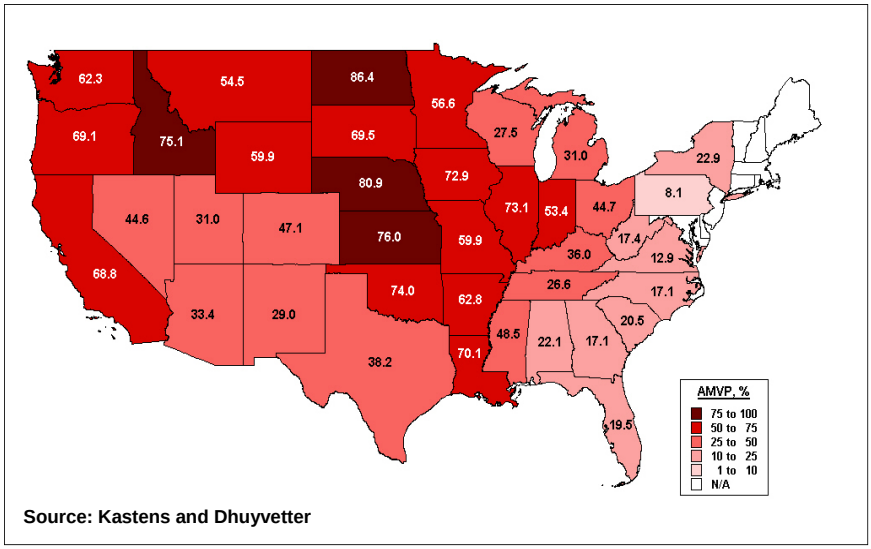
- Jan. 1, 2004 land value = $705 /acre
- Cash rent for 2004 = $37.50 /acre
- 2004 property tax = $4.17 /acre
- 2004 after-property-tax rent = $33.33 /acre
- $33.33 / 0.0664 = $502 /acre

- AMVP (non-irr) = $502 / $705 = 0.712 = 71.2%



percent of land value that is due to agriculture

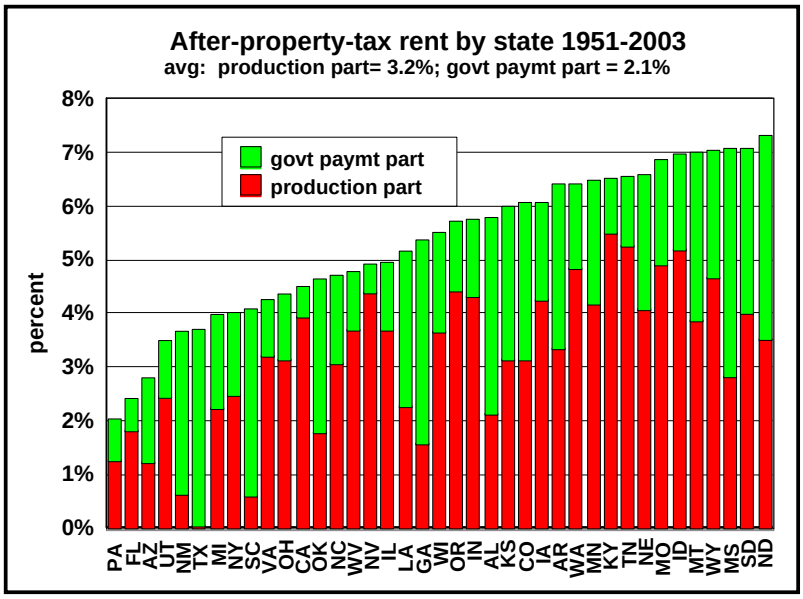
Portion of Land Value Attributed to Agricultural (production and government payments)



Source: Kastens and Dhuyvetter

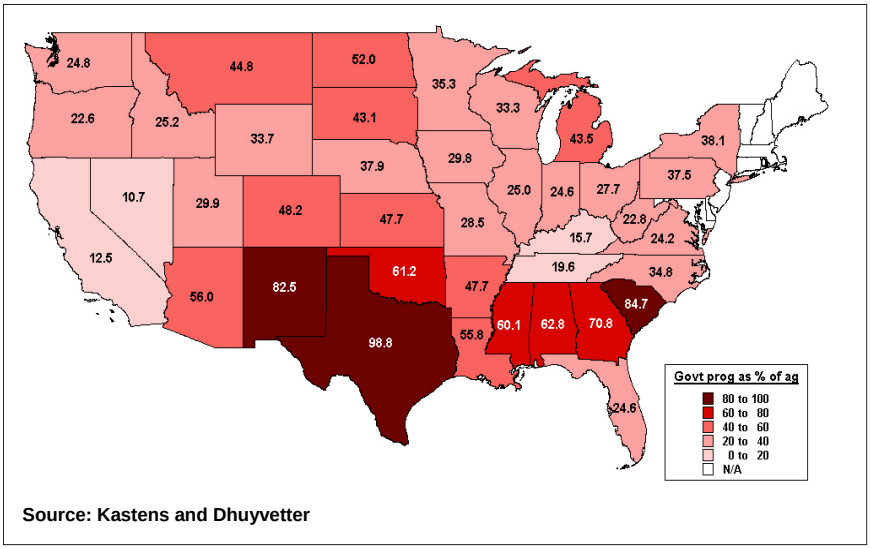
Government Program Payments

- Generally, are thought to be capitalized into land values and cash rents
- Many Great Plains states and many Southern states are highly dependent on government program payments



ranked by total rent

Percentage of Agricultural Value Attributed to Government Program Payments

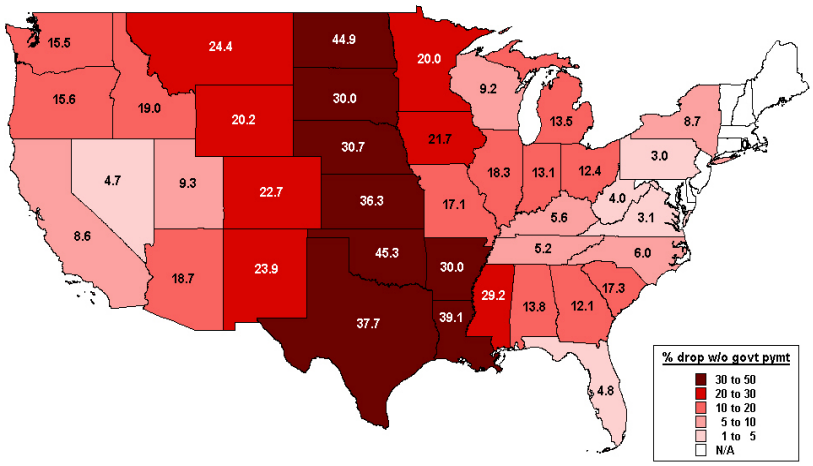


Source: Kastens and Dhuyvetter

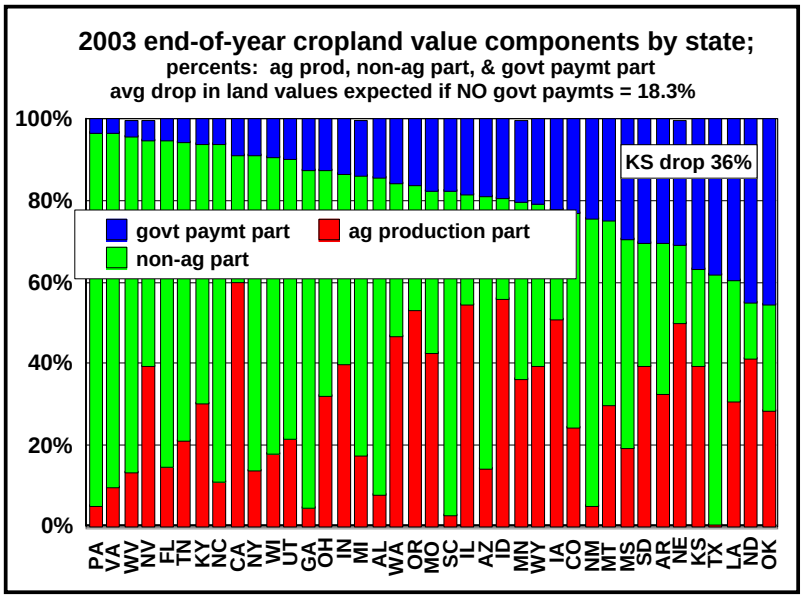
Government Program Payments

- States whose land values have substantial non-ag components would not suffer as much in the absence of payments
  - Alabama and Georgia are notable Southern states
  - Great Plains states don't have that advantage

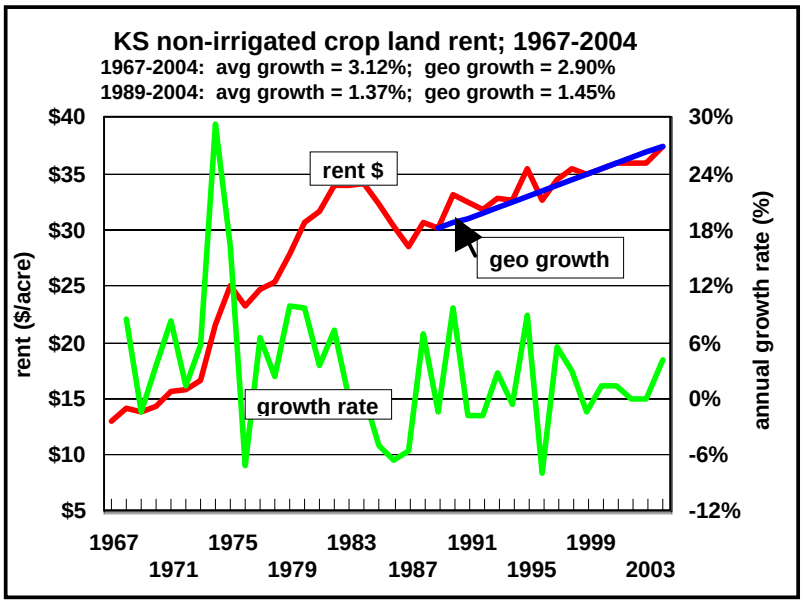
Estimated Reduction in Land Value with the Elimination of Government Programs

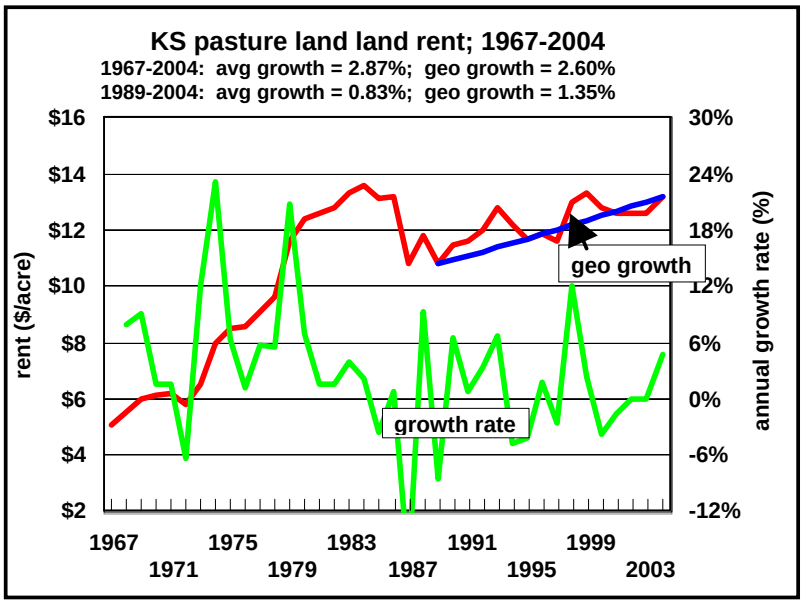


Source: Kastens and Dhuyvetter



ranked by percent of land value that is due to government program payments


KS non-irrigated crop land rent; 1967-2004
1967-2004: avg growth = 3.12%; geo growth = 2.90%
1989-2004: avg growth = 1.37%; geo growth = 2.90%
rent ($/acre)
annual growth rate (%)
$40
$35
$30
$25
$20
$15
$10
$5
30%
24%
18%
12%
6%
0%
-6%
-12%
rent $
geo growth
growth rate
1967
1971
1975
1979
1983
1987
1991
1995
1999
2003


KS pasture land land rent; 1967-2004
1967-2004: avg growth = 2.87%; geo growth = 2.60%
1989-2004: avg growth = 0.83%; geo growth = 1.35%
rent ($/acre)
annual growth rate (%)
$16
$14
$12
$10
$8
$6
$4
$2
30%
24%
18%
12%
6%
0%
-6%
-12%
geo growth
growth rate
1967
1971
1975
1979
1983
1987
1991
1995
1999
2003

Buying Land – How much can I afford?

- Valuing the capital gains portion
  - Pick a "selling point," say 30 years from now
  - What will the land be worth then?
    - Assume some annual capital gain % -- ag and non-ag
  - What is left after "sell" & pay cap gains tax?
  - What is that amount worth today?
- Valuing the rent portion
  - What is cash rent today, ag and non-ag?
  - How will rents evolve (grow) over time?
  - What is the future stream of rents worth today?
- Maximum bid = today's value of the capital gain + today's value of the rent stream

Using *KSU-Landbuy* *(go to Excel)*

Questions ???

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