

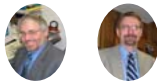
Future of Agriculture

Economies of Size and Trends in Agriculture

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What motivates farmers?

- Farming: profit or lifestyle?
- About what will make *some* farms profitable in the future
 - The ones that will be around in commercial ag
- One part of a bigger picture
 - What to do with wealth
 - What to do with human capital (personal skills)

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Economies of size: the driving force

- Per-unit costs fall as a firm gets bigger
 - Essentially about spreading fixed costs
 - May mean higher prices instead

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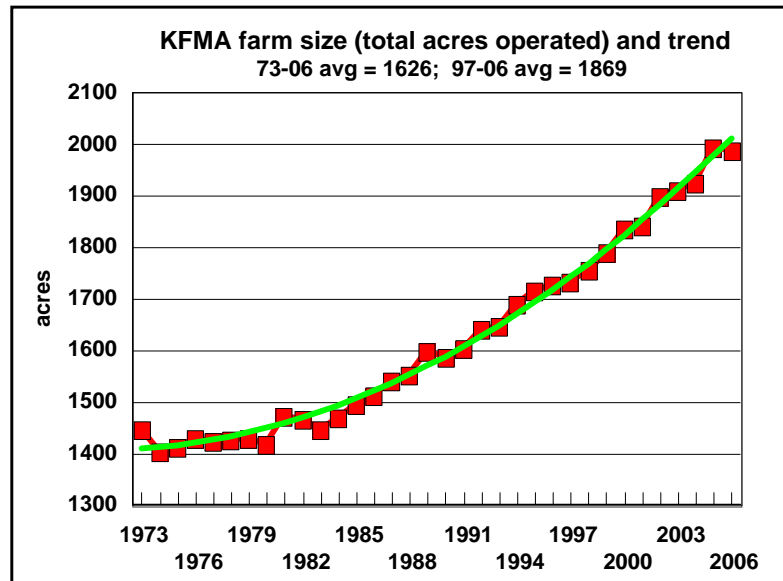
Is EOS for real?

- Is there a benefit to targeting growth and size?
- Or, is growth an accident of good management (plowing profits back into the farm or business)?
 - Walmart: size, or a good retailing idea??
 - Why don't we observe numerous small packing plants?
 - Why don't we observe many small farms with a common manager?

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Is EOS for real?

- EOS doesn't mean you have to be big to be low cost
 - Many small farms have low costs
 - But, it's harder to be low cost if you are small
 - EOS is an "on average" phenomenon
- Little evidence of big, high cost, farms
 - They've gone broke



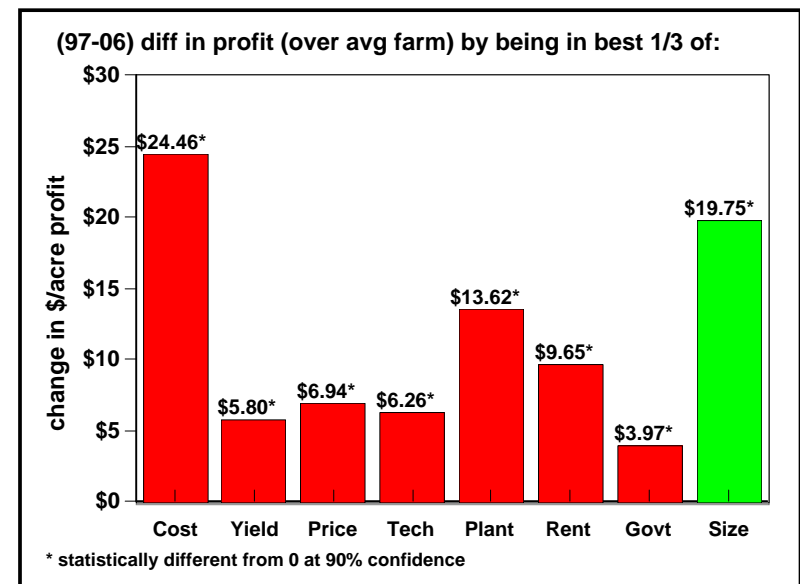
Farm size has been increasing at an increasing rate

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Is EOS for real?

- Hard to distinguish effect of good management and other factors from effect of size
- Statistical regression is one way to do it
 - After you correct or adjust for the impact of other factors, is there still a positive impact on profit associated with size?



A size effect remains – evidence that EOS is for real

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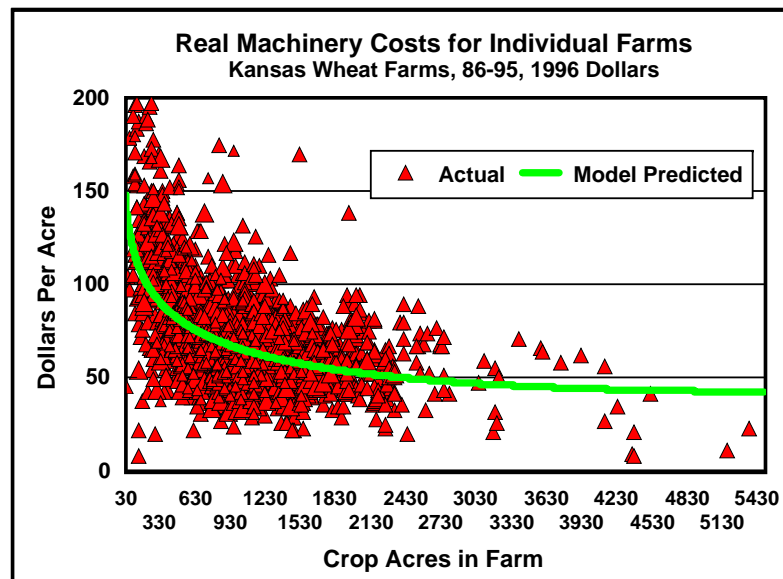
No right to profit from size

- Being large does not ensure profitability
 - Inherited, but poorly managed (inattentive to size and growth issues), farms are an example. Though it might take years, such farms eventually disappear.
- A poor-managing heir would be better off:
 - Investing his/her wealth elsewhere
 - Renting the land portion to a good manager

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Do EOS turn to diseconomies at sufficiently large size?

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You be the judge! But where are the 10,000 acre farms and what might their machinery costs be?

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Do EOS turn to diseconomies at sufficiently large size?

- Government payment limitations?
 - Business structure
 - Willingness to share ownership and management
- Large farms often are targeted for...
 - environmental concerns (EPA)
 - crop insurance audits
 - terrorism?
- Can management handle size and growth?

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What about niche farming? Do we really need to get on the EOS bandwagon?

- Targeting a niche is a risky game plan
- Perceived niches not immune to EOS
 - “Remember, every niche is a commodity in the making.” Vincent Amanor-Boadu
- Becoming a large commercial farm also is a risky plan
- Recognize your comparative advantage



Changing EOS features across farm size

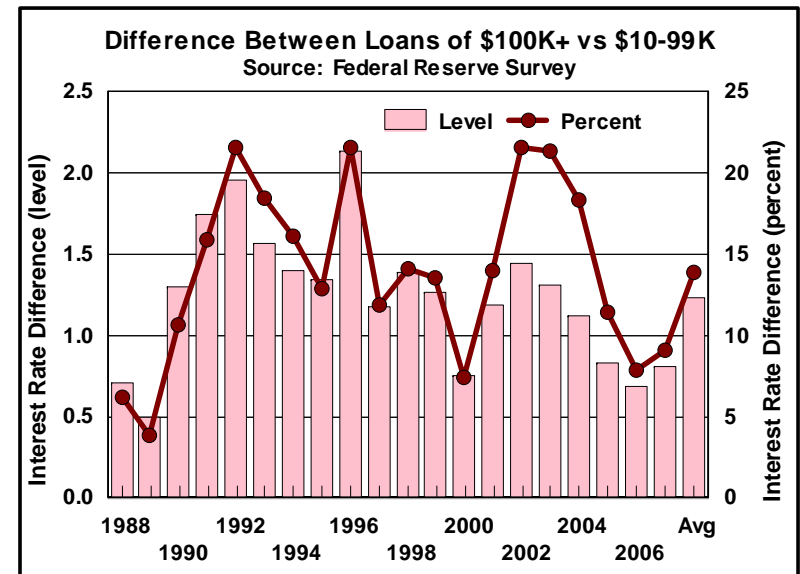
- Labor first
 - Labor is fixed and it pays to be fully employed
- Machinery second
 - Bigger machines are less expensive per unit of capacity

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Changing EOS features across farm size

- Other things third
 - Management can be spread over still more acres
 - e.g., marketing, hybrid selection, technology evaluation, assessing FSA or crop insurance opportunities
 - Quantity price discounts or premiums
 - Crop sales
 - Machinery and crop input purchases
 - Larger loans mean lower interest rates

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Bigger loans have lower interest rates

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Changing EOS features across farm size

- **Less direct things fourth**
 - **Large geographical spread**
 - Less yield and profit risk
 - Quicker reliable inferences from farm level data
 - More opportunities to rent additional land
 - **Business image: landlords favor large farms**
 - Or is it youth, longevity, profitability, technological advancement, and community viability?

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EOS implications: equity

- **It takes so much to get started today!**
- **Internal profits (reinvest profits)**
- **Vertical accumulation**
 - Family wealth across generations
 - Diverging goals of heirs and forebears
- **Horizontal accumulation**
 - Family or non-family contemporaneous equity
 - Minority shareholders have poor protection
- **Successful farms will overcome the equity hurdles**

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EOS implications: debt

- **Capital is equity OR debt**
- **Debt often is the least-cost capital source**
- **If equity growth is internal:**
 - Farms using debt have an advantage for EOS
- **Recommendations to “pay down debt” are a vestige of traditional life-cycle thinking**
- **Successful farms will consider**
 - Divorcing the business from the individual
 - Targeting a debt-to-assets ratio rather than a debt level (think of agri-businesses)

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EOS implications: labor

- **Show young people they can start in farming as an employee, just like what happens in every other business**
 - Will happen as wages climb
- **Show established owner-operators how they can transform to employee/partner types without losing face, and without sacrificing wealth and happiness**

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Trends . . .

1. Increasing consolidation
 2. Rapid technological change
 3. Greater connections to the non-ag world
 4. Increased computer work and paper work
 5. More reliance on people with specialized skills
- Trends go hand in hand with economies of size

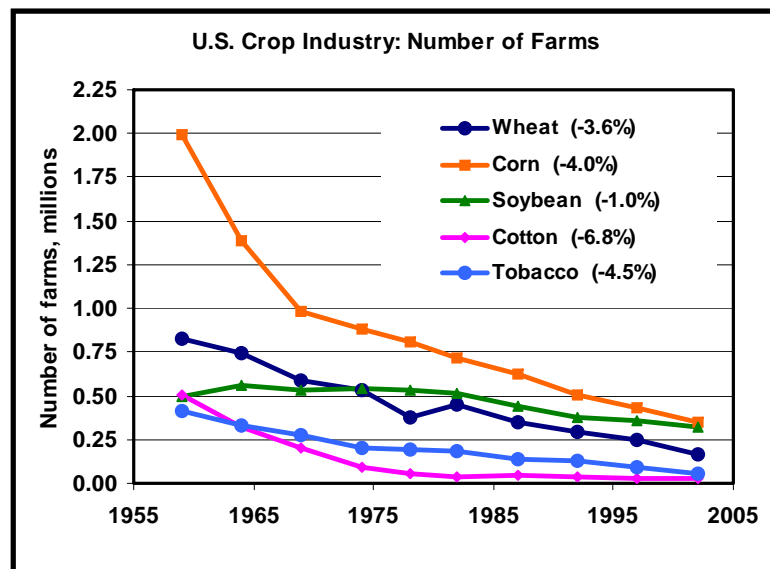
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1. Consolidation

- The same or more business conducted by fewer firms
 - Cars started with Ford, numerous by 1940's, consolidated by 1970's
 - Many dry goods retailers, now Walmart
 - Currently mostly Deere and CNH in US
 - Fewer packers, cattle feeders, dairies, swine operations, and crop farms
 - But also fewer lenders, machinery dealerships, grain elevators, and crop/livestock input providers
- Driven by economies of size

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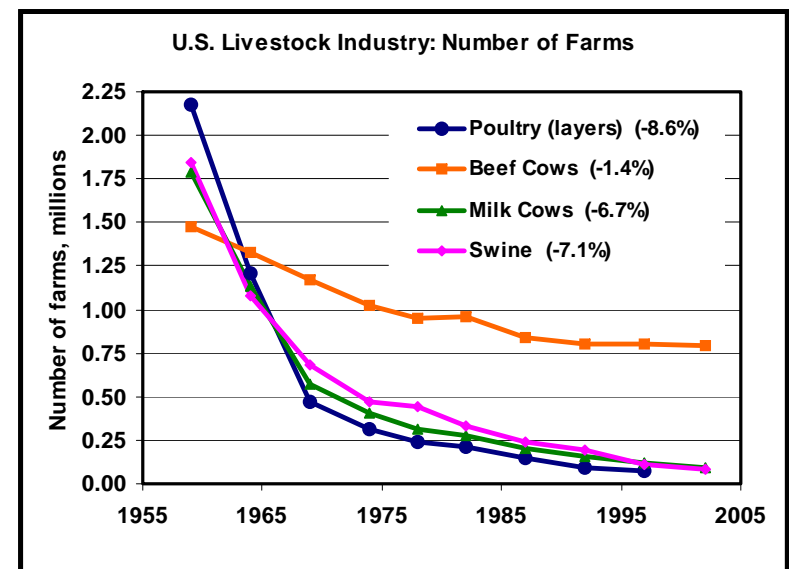
Trends in crop farm numbers . . .



Source: Census of Agriculture

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Trends in livestock farm numbers . . .



Source: Census of Agriculture



Concentration of U.S. animal agriculture in 2006 . . .
 (production from approximately 10% of operations)

	Size of operation (hd)	Percent of operations	% of I, M, or P*
Beef cows	100+	10.3%	57.0% (I)
1000+ head Feedlots**	24,000+	8.6%	60.7% (M)
Dairy	200+	10.3%	66.6% (P)
Swine	2,000+	11.8%	80.0% (I)

* I = Inventory, M = Marketings, P = Production

** Feedlots with 1000+ head represent 2.4% of all feedlots and account for 86.1% of marketings

Source: USDA NASS and K-State

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Will consolidation in crop production speed up?

- **Farm machinery:**
 - More like a fixed investment in factory facilities
 - Sophisticated, expensive, for round-the-clock use
- **People:**
 - Skills required are becoming more specialized
 - often requiring different people (like other businesses)
 - Management becomes fixed cost
 - Business continuity means a management team
 - Even larger fixed cost
- **Remember, we never saw the rapid consolidation in poultry, swine, and dairy coming either**

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Implications of consolidation

Think of:

PARTNERS

Not COMPETITORS

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2. Technology

- **Early adopters get the profits**
 - Bid into cash rents and land values
 - Higher rents mean higher costs and non-adopters find themselves going broke in the face of rents they perceive as “too high”
- **Speed of adoption depends on:**
 - A) magnitude of expected profitability
 - B) degree of confidence in the expected profit
 - C) size of investment

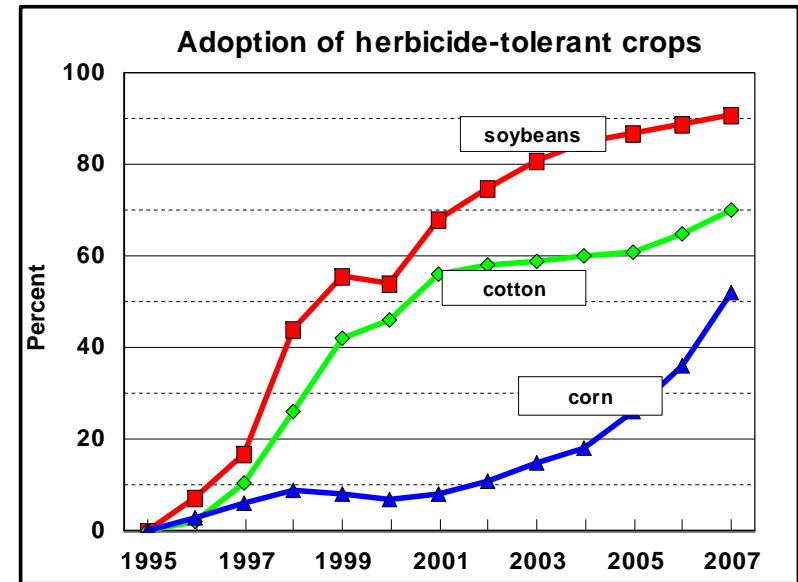
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Technology: speed of adoption

- Big and obvious gains probably non-existent
- Small, obvious, gains along with small investment implies fast adoption
 - “belly-button” or “duh” technologies
 - Roundup-Ready soybeans

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Some technologies are fairly obvious . . .



Source: USDA/ERS

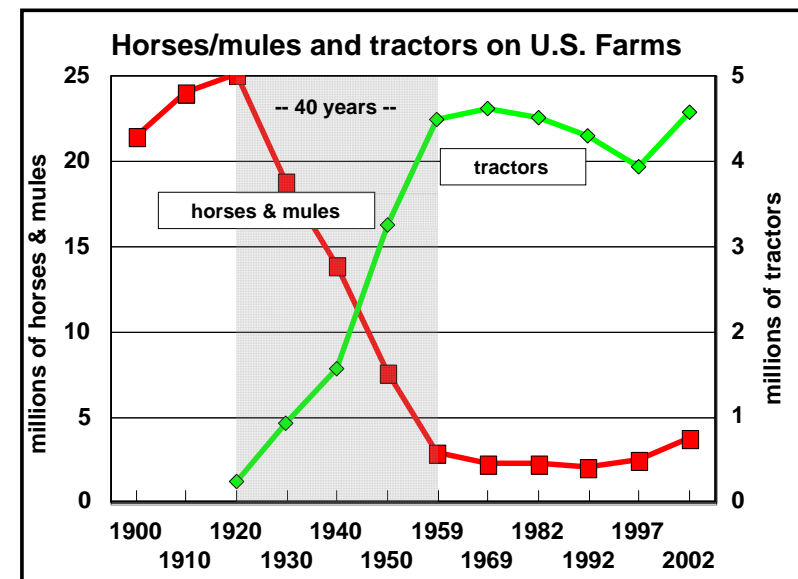
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Other “duh” technologies (most farms)

- Lightbars (GPS guidance)
 - Gains against overlap and marker alternatives are easy to assess
 - Do take a little more investment so less adopted by small farms
- Tractor cabs
 - Hard to measure gain in \$ but know it's there
- GPS-assisted steering
 - Larger investment than lightbars but still easy to measure advantage
 - Aspects like tractor cabs (reduces stress)

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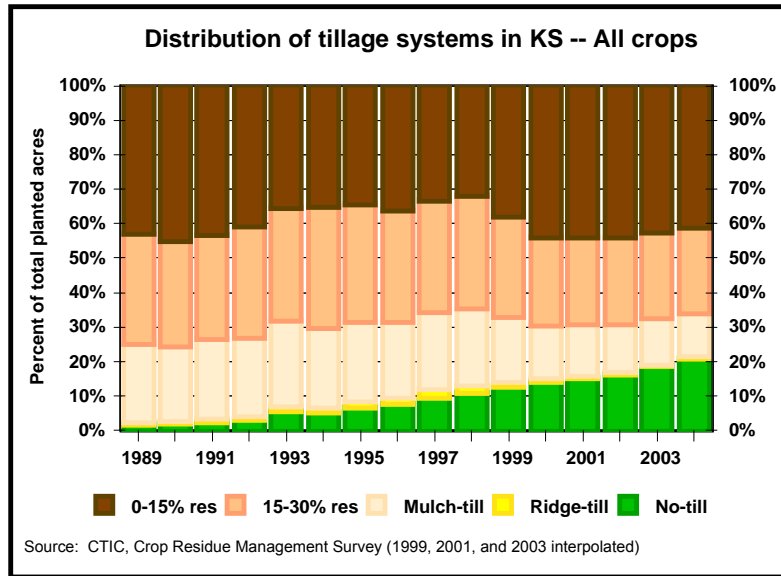
Some technologies aren't so obvious . . .



Source: U.S. Census of Agriculture

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Some technologies aren't so obvious . . .



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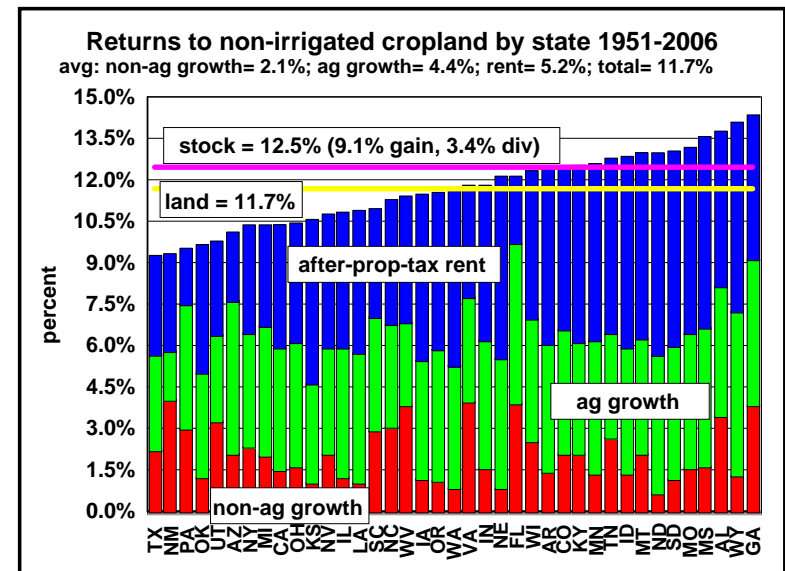
Technology: how to get an edge

- Invest in the “duh” technologies quickly
 - You don't have a choice
- Invest in the slow moving technologies
 - The profits will last for years
- Invest in technologies that DO NOT save labor
 - Most people do not; hence the gains last for years

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3. More connections with non-ag

- More opportunities for non-farmers to invest on-farm (e.g., landowners)
- More opportunities for farmers to sell services to non-farmers (e.g., lease hunting)
- More opportunities for farmers to invest off-farm (e.g., ethanol)
- Increase need for analytical abilities and people/communication skills



39 states ranked by total returns to land

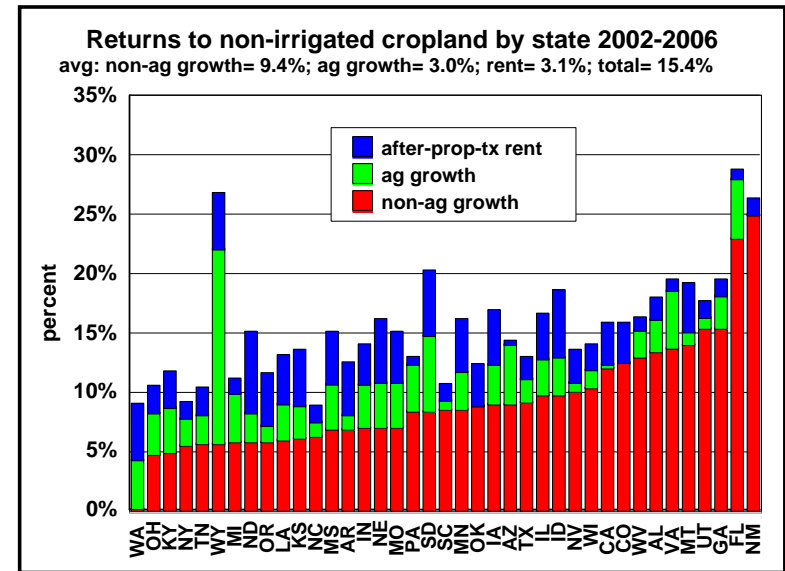
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Factors/issues impacting land values

(alphabetical order)

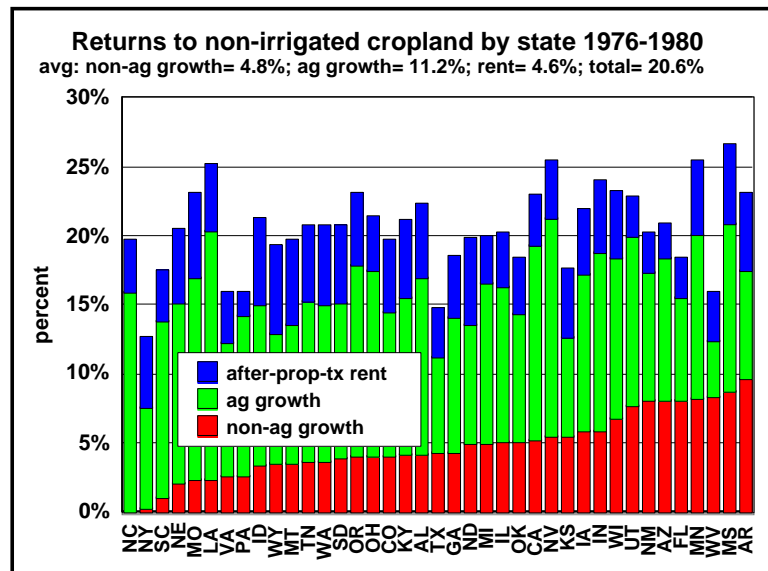
- Farm profitability
- Farm size
- Government programs
- Input costs (e.g., fuel and fertilizer)
- Interest rates
- Outside investors (i.e., stock market money)
- Recreation uses (e.g., hunting)
- Renewable fuels (ethanol and bio-diesel)
- Section 1031 tax exchanges
- Technology (e.g., no-till, precision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

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Non-ag growth much more important lately; total returns not especially high

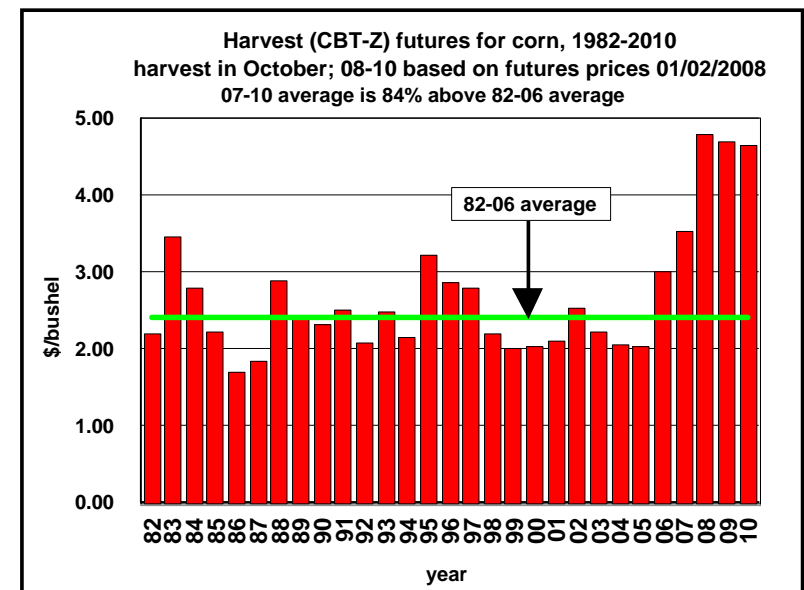
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Dominated by growth in ag rents (inflation); total returns very high

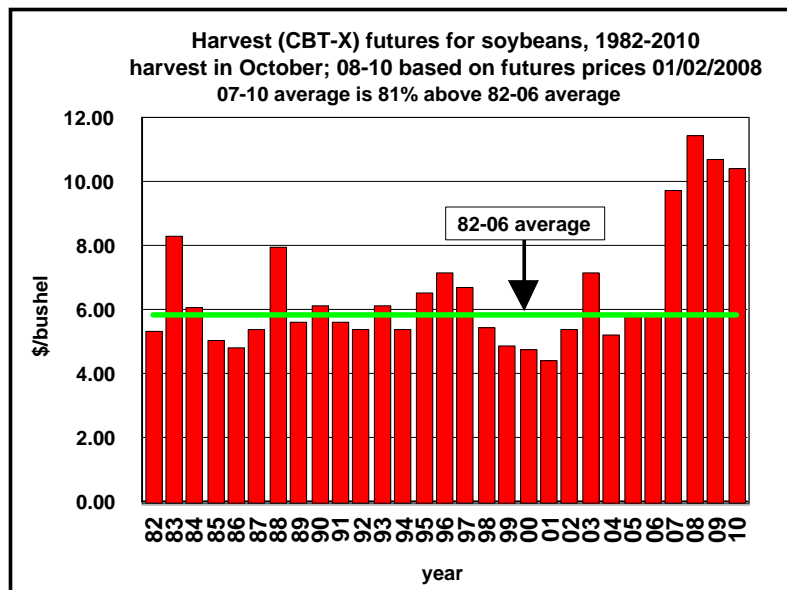
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How long will strong prices stick around?



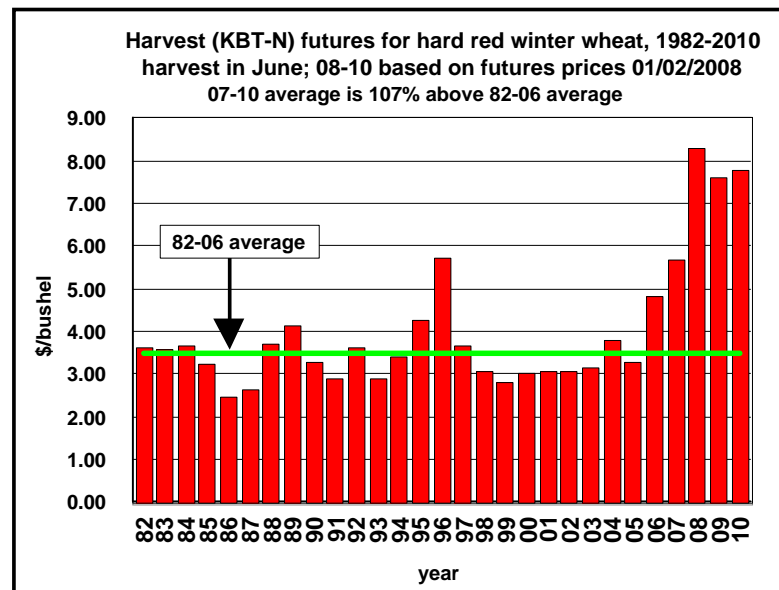
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How long will strong prices stick around?



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How long will strong prices stick around?



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4. More paperwork (computer work?)

- A. Improved accrual accounting
- B. Better capital asset management
 - land and machinery
- C. Improved production data mgmt & analysis
 - precision ag / on-farm research
- D. Better day-to-day decisions on complex issues

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Day-to-day decisions improved

- Crop insurance is an example
 - Many policies and choices
 - Talking to neighbors won't cut it
- Land rental agreements is another example
 - New rotation and tillage programs complicate
 - Talking to neighbors won't cut it
- Need to be able to objectively and numerically analyze decisions
 - "Management by numbers"

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5. Need folks with specialized skills

- **Financial management**
 - Agricultural economics and accounting
- **Production management**
 - Agronomy and animal science
- **Machinery understanding and management**
 - Agricultural engineering
- **Spatial data management**
 - Geography
- **Computer specialists**
- **Legal counsel**

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Questions ???



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