

Land Values: Current and Future Prospects

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Farm Credit Administration

Regulators' Roundtable on Farm Real Estate Collateral Risk

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Agenda

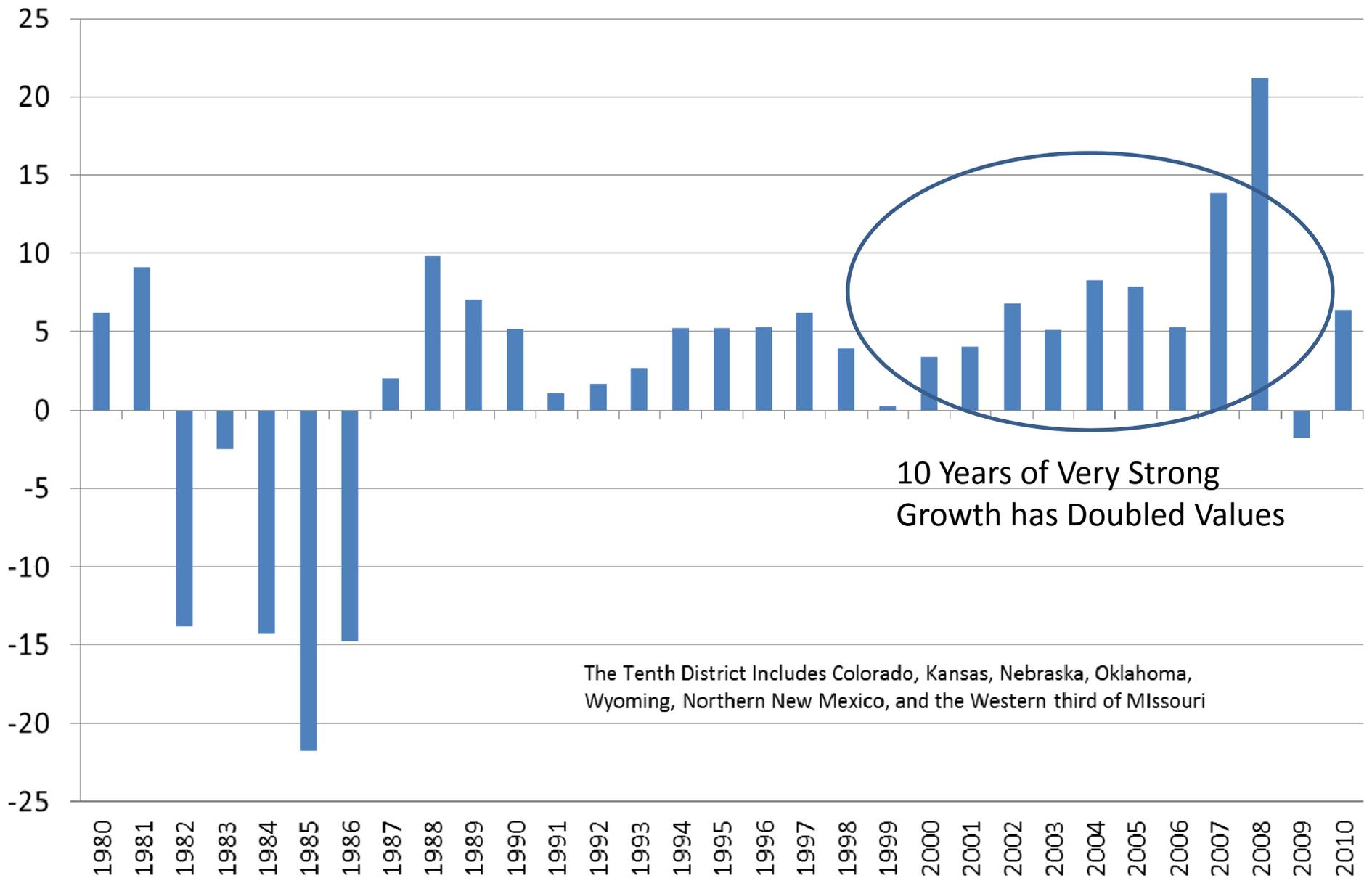
- Background
 - What causes bubbles?
 - Valuation basics
- How did we get here?
 - Crop returns and income
 - Interest rates
- Are land values reasonable?
- What are the risks?

Current Land Market

Characterized by:

- Rapidly rising values
 - Iowa up 16% in 2010 \$1,857 in 2000 today \$5,064 (CAGR of 11% for last 10 years)
 - 10th Fed district 7% CAGR last 10 years
 - Generally thin market – turnover approx. 1.5% according to NE study
 - Headline sales that may or may not be representative
 - Investor interest
 - General sense of optimism

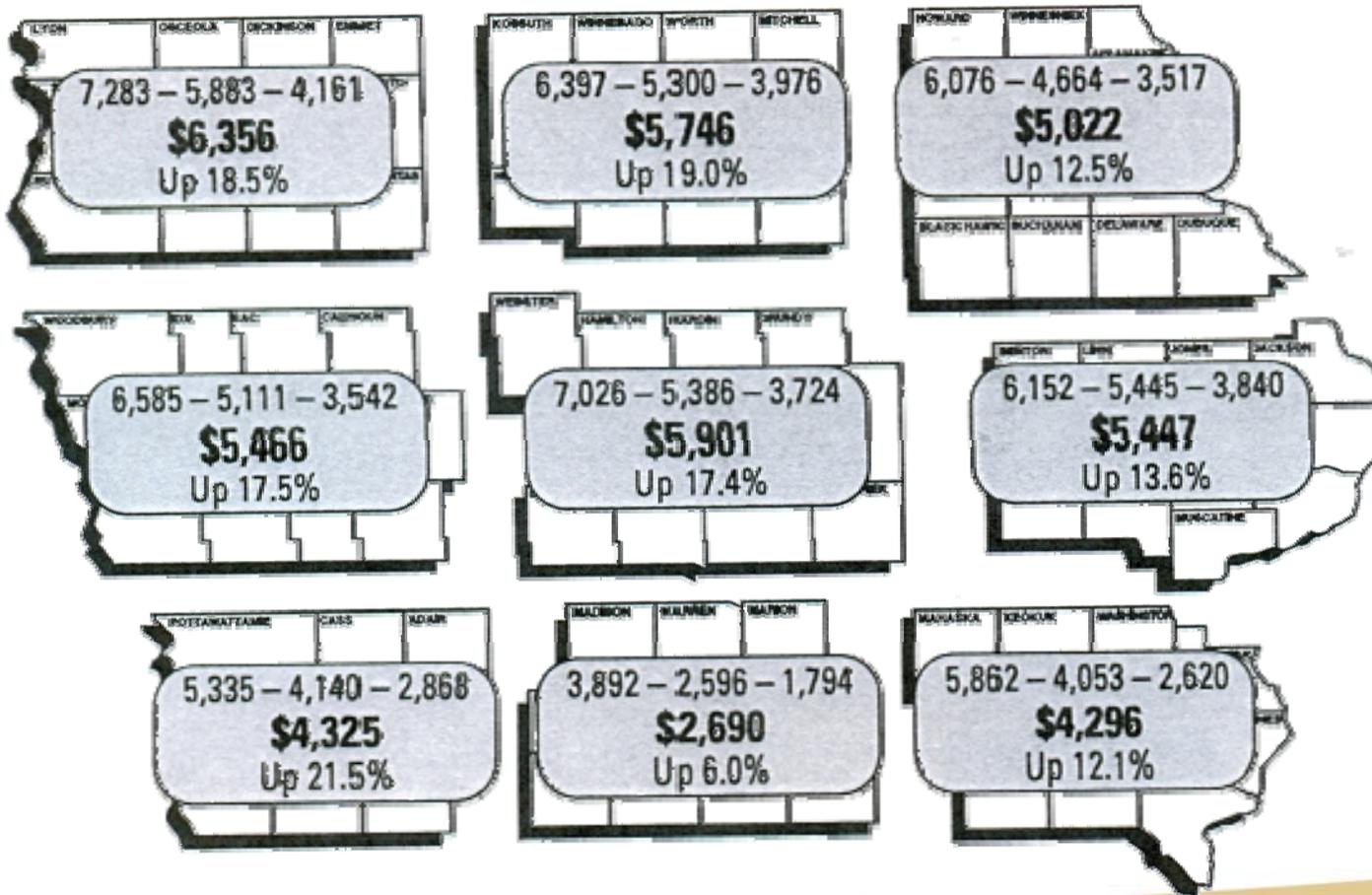
Percent Change from a Year Ago In Non-Irrigated Farmland Values of the 10th Federal Reserve District, Third Quarter 1980-2010



10 Years of Very Strong Growth has Doubled Values

The Tenth District Includes Colorado, Kansas, Nebraska, Oklahoma, Wyoming, Northern New Mexico, and the Western third of Missouri

Estimates of average dollar value per acre as Nov. 1, 2010, by Iowa crop reporting districts from IA State Survey.



First line:
high-, medium-, and low-grade farmland values.

Second line:
district average.

Third line:
average percentage change since Nov. 1, 2009.

Price per Acre for Average Quality Indiana Farmland, 1975-2010



Setting the Stage

Two questions

1. Is it possible that land values could be significantly (20-30%-40%) lower 3-5 years than today?
2. Is there a bubble in the land market?

Not necessarily the same thing

- A bubble implies irrationality in the market and/or a short-term structural issue that impacts market transactions
 - People buying/selling in a panic because prices only go up/down
 - People forced to sell due to sudden liquidity crisis
 - People encouraged to buy, take risk with massive amounts of OPM (liquidity glut)
 - Asset prices diverge from any reasonable view of economic fundamentals

Things That Tend to Fuel Bubbles

- Markets that allow participants to easily capture capital gains along the way and/or roll capital gains into ever bigger bets
- Easy access to credit for the purchase of the capital asset with someone willing to accept lots of risk
- Widespread uncertainty about the level of economic fundamentals and their future outlook
- New demand (uninformed market participants wanting to enter the market)

Why Do We Get Bubbles?

- Capital asset values are determined by *EXPECTATIONS* of the level of future earnings and their present value
 - Earnings are difficult to forecast
 - Interest rates and inflation drive present values and are equally difficult to forecast
- It is very difficult to understand when expectations are misinformed
- **In order to determine whether this is a bubble we need to conclude the prices are clearly out of line with economic fundamentals**

What Drives Value?

- General idea of purchasing capital assets
 - Obtain the rights to future earnings for a price less than the real earnings that it will produce
 - The lower the price relative to earnings the better the rate of return
- Earnings expectations
- Opportunity costs (interest rates)
 - E.g., Government bond rates

A Conceptual Base for Farmland Prices

A Simple Model of Farmland Values

The income capitalization model:

$$\text{Farmland Value} = \frac{\text{Income}}{\text{discount rate (\%)} - \text{growth rate (\%)}}$$

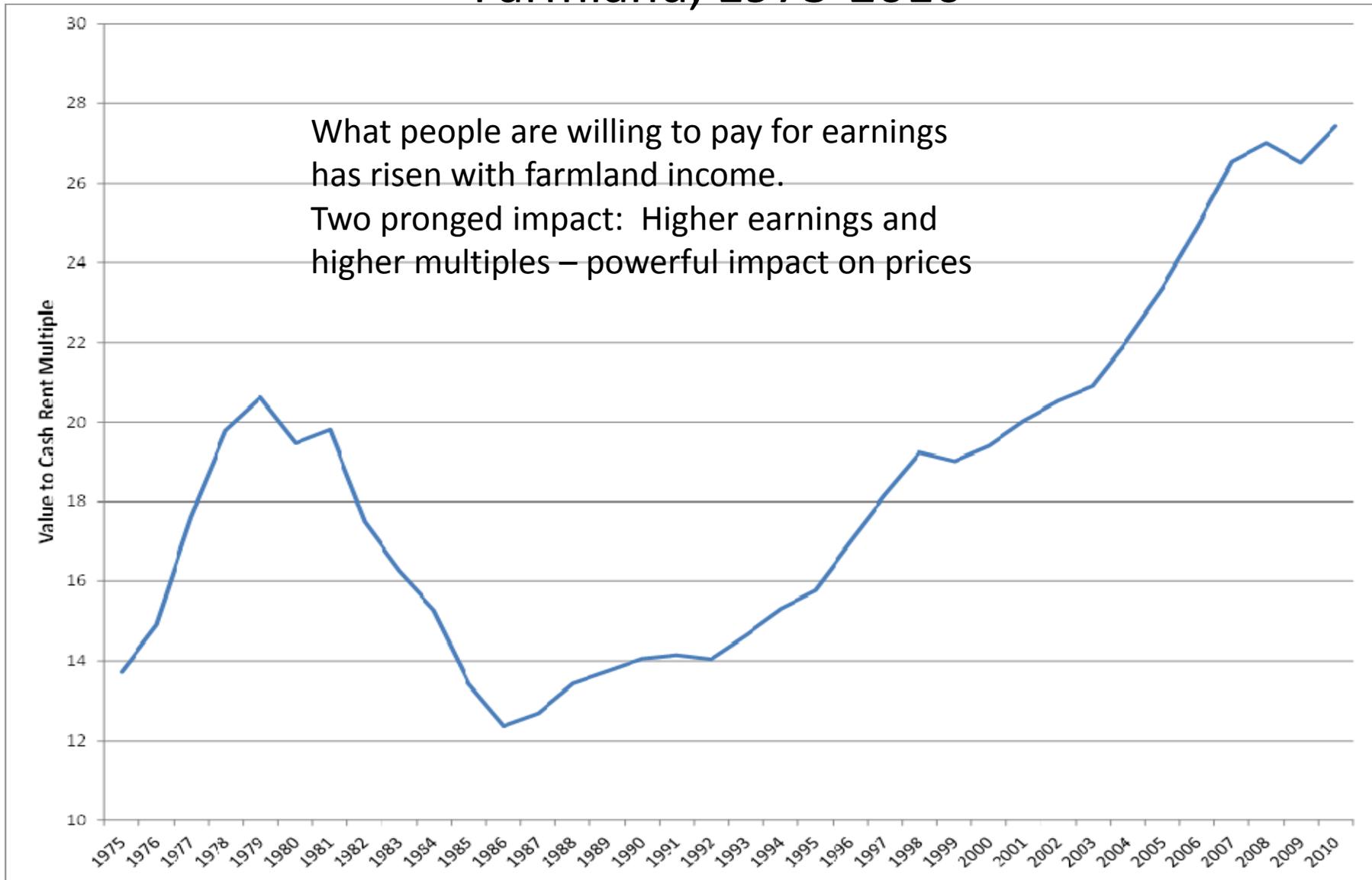
Important points:

↑ Income → land value ↑
↑ Discount rate → land value ↓
↑ Income growth rate → land value ↑

6% discount rate less 1% growth = 5% “cap rate”

Cash rent multiple is the inverse of the cap rate

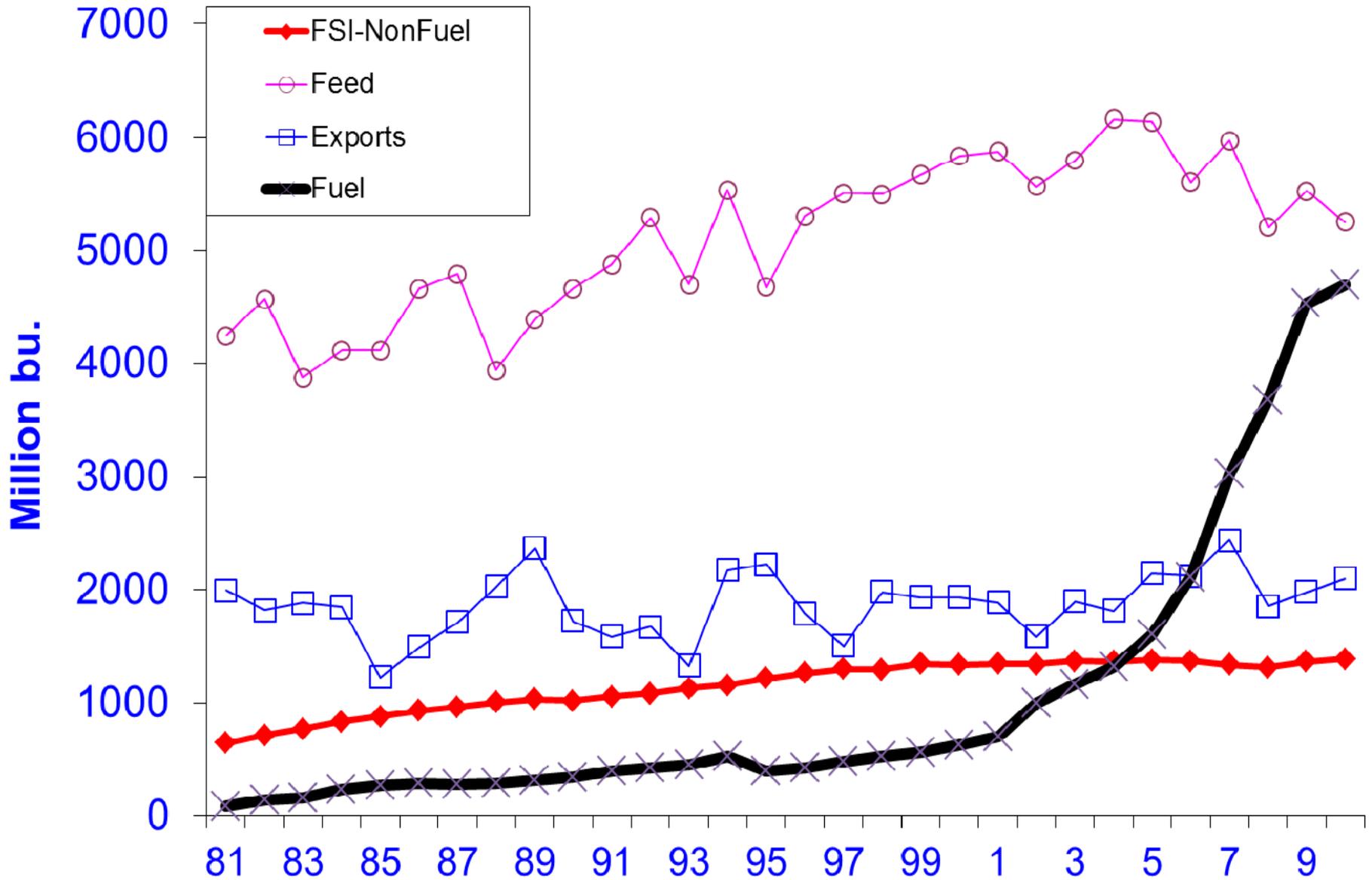
Value-to-Rent Multiple for Average Quality IN Farmland, 1975-2010



So How Did We Get Here?

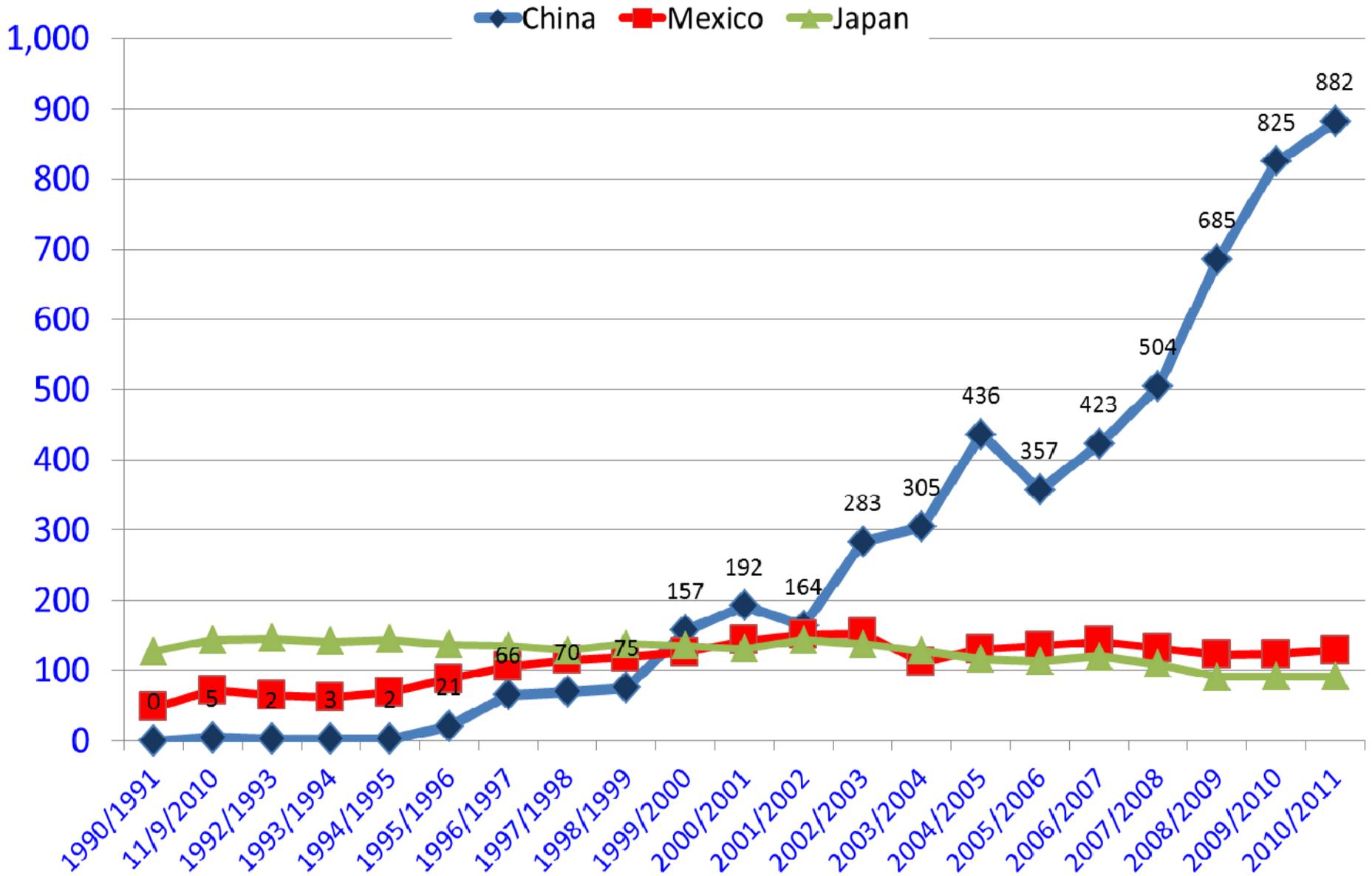
- Returns
 - Biofuel demand
 - Strong demand from emerging markets
 - Weather shocks/poor yields
- Generally decreasing interest rate environment
 - Rates at 30 year lows

Corn Use

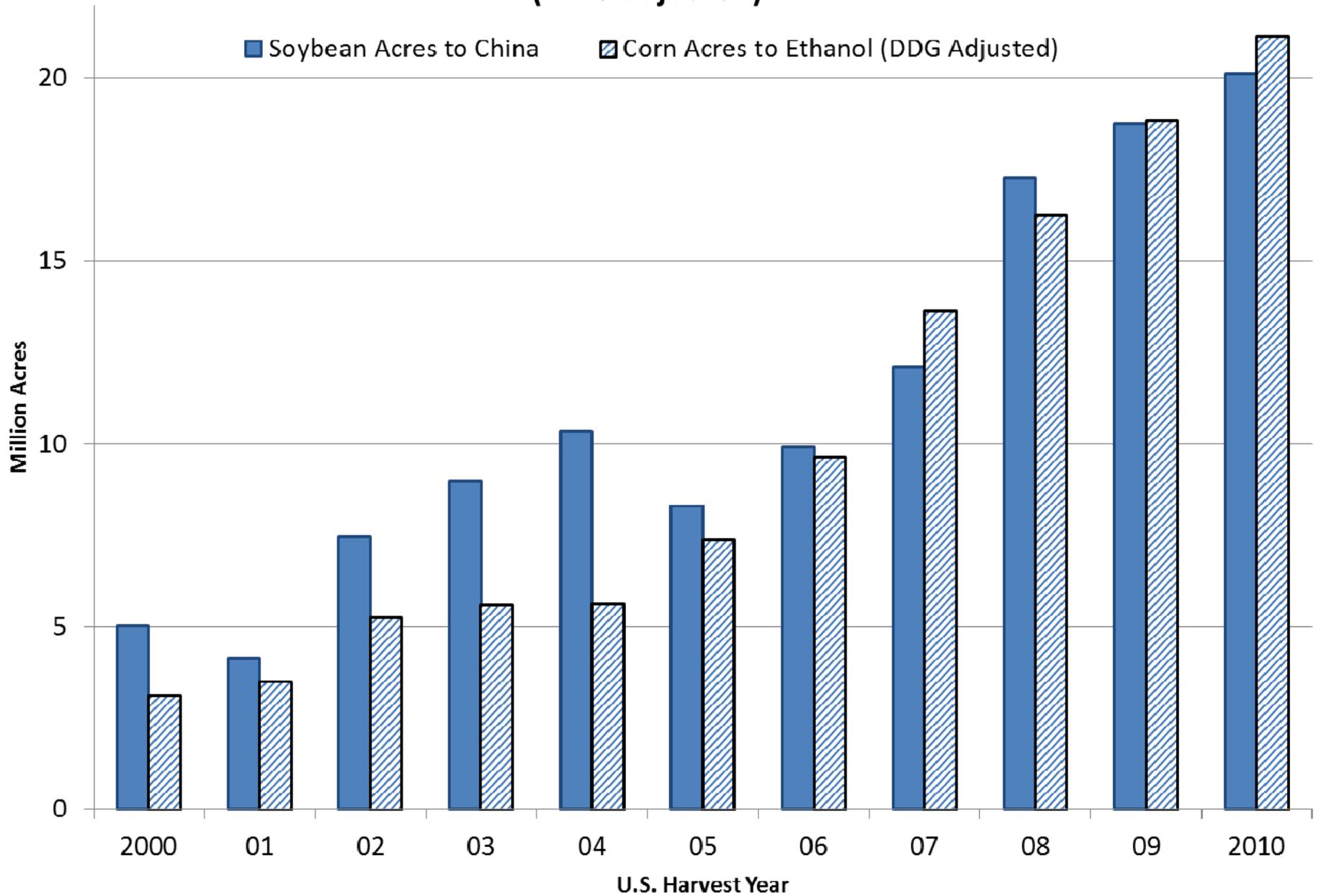


Soybean Imports from the U.S.: 1990/91-2010/11 (Mill Bu.)

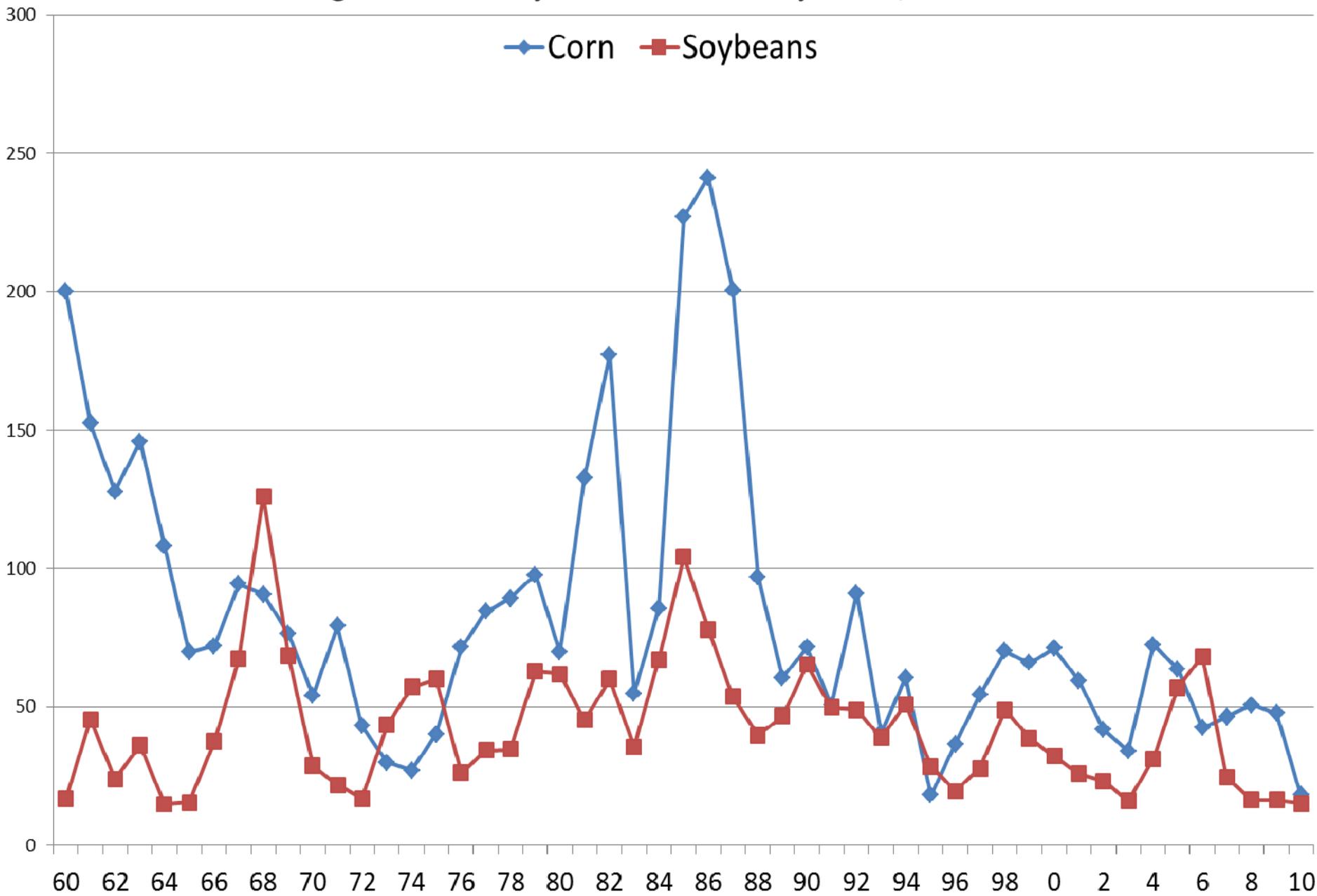
11/9/10



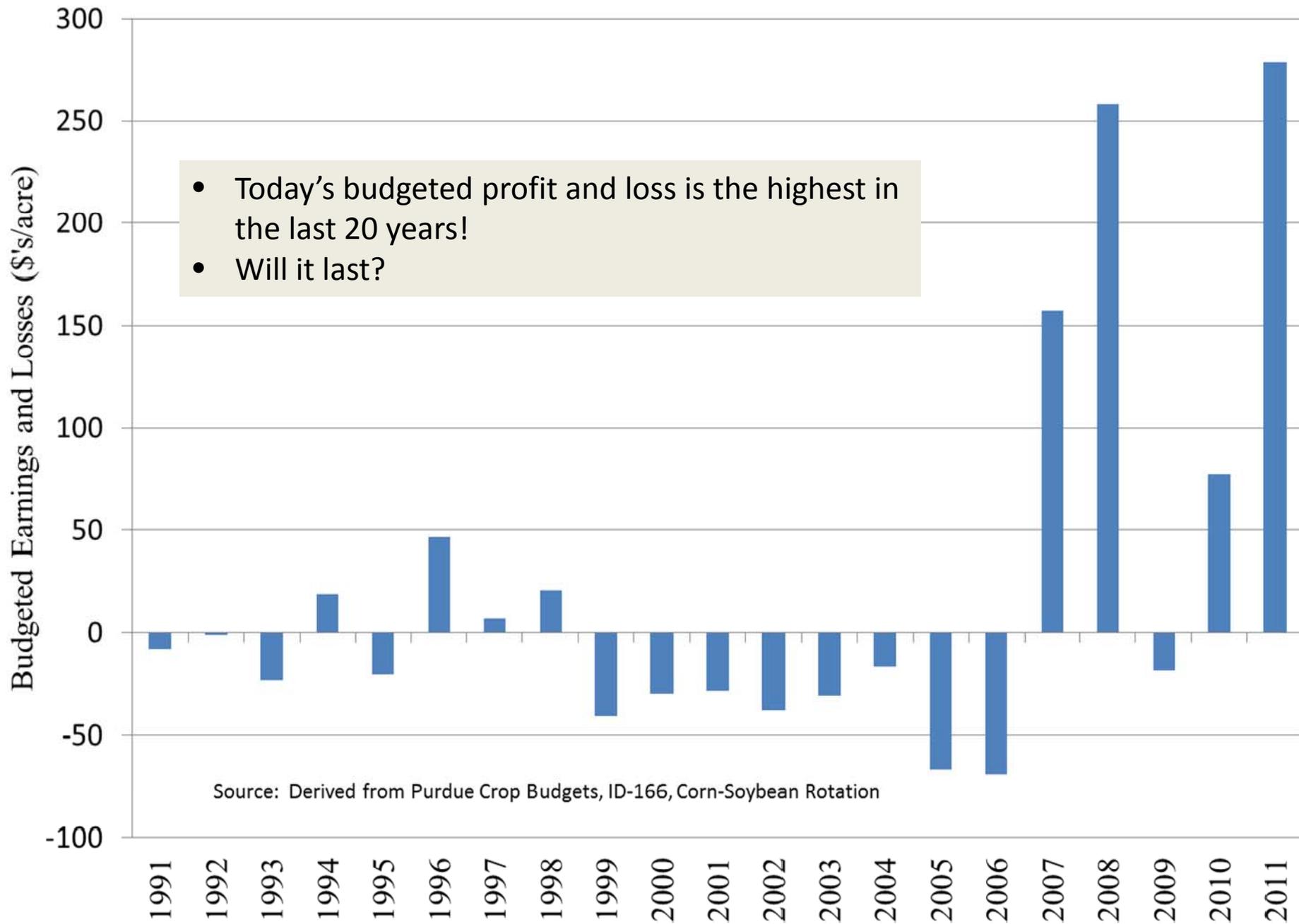
U.S. Soybean Acres Destined for China and U.S. Corn Acres to Ethanol (DDG adjusted)



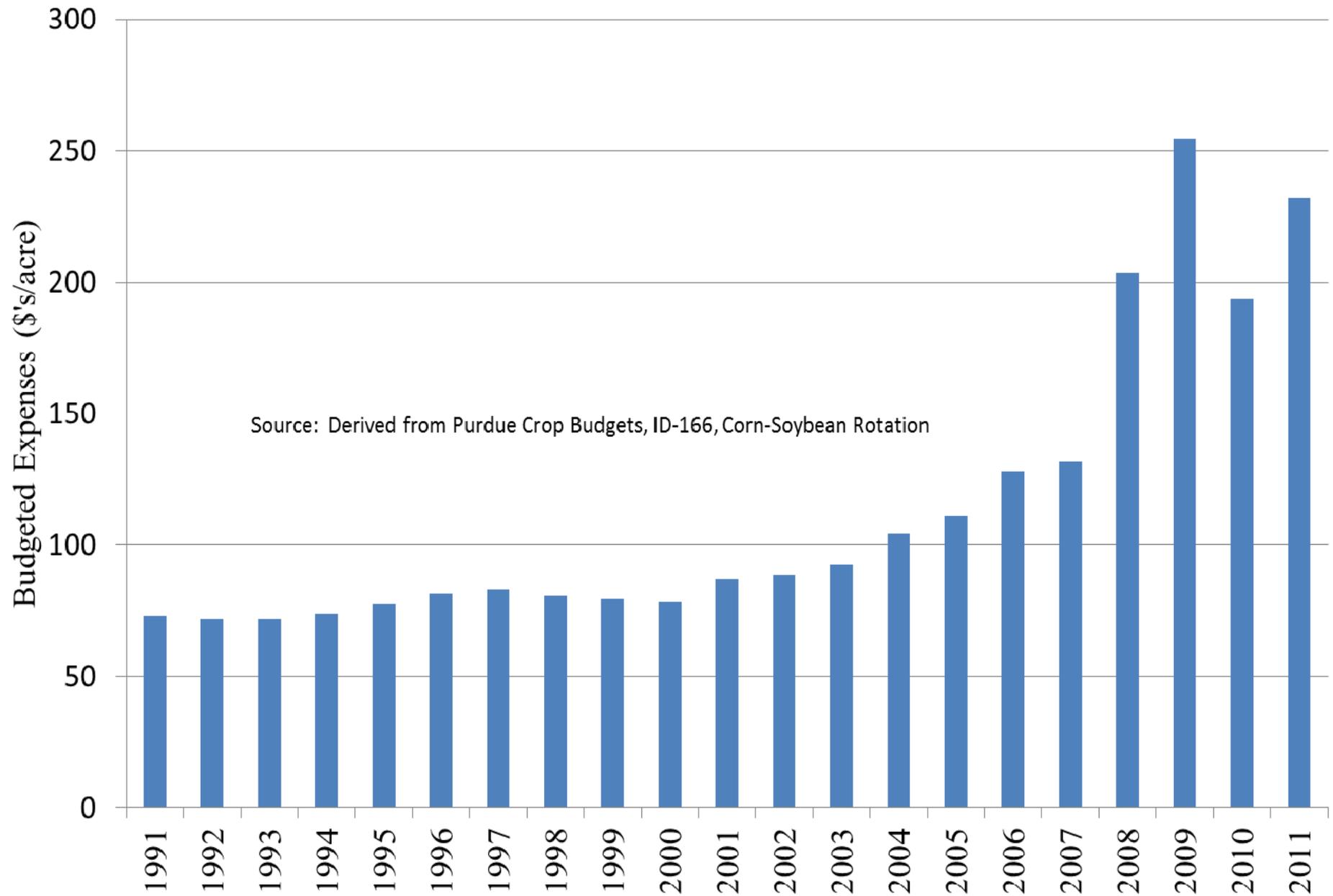
Ending Stocks in Days for Corn and Soybeans, 1960-2010



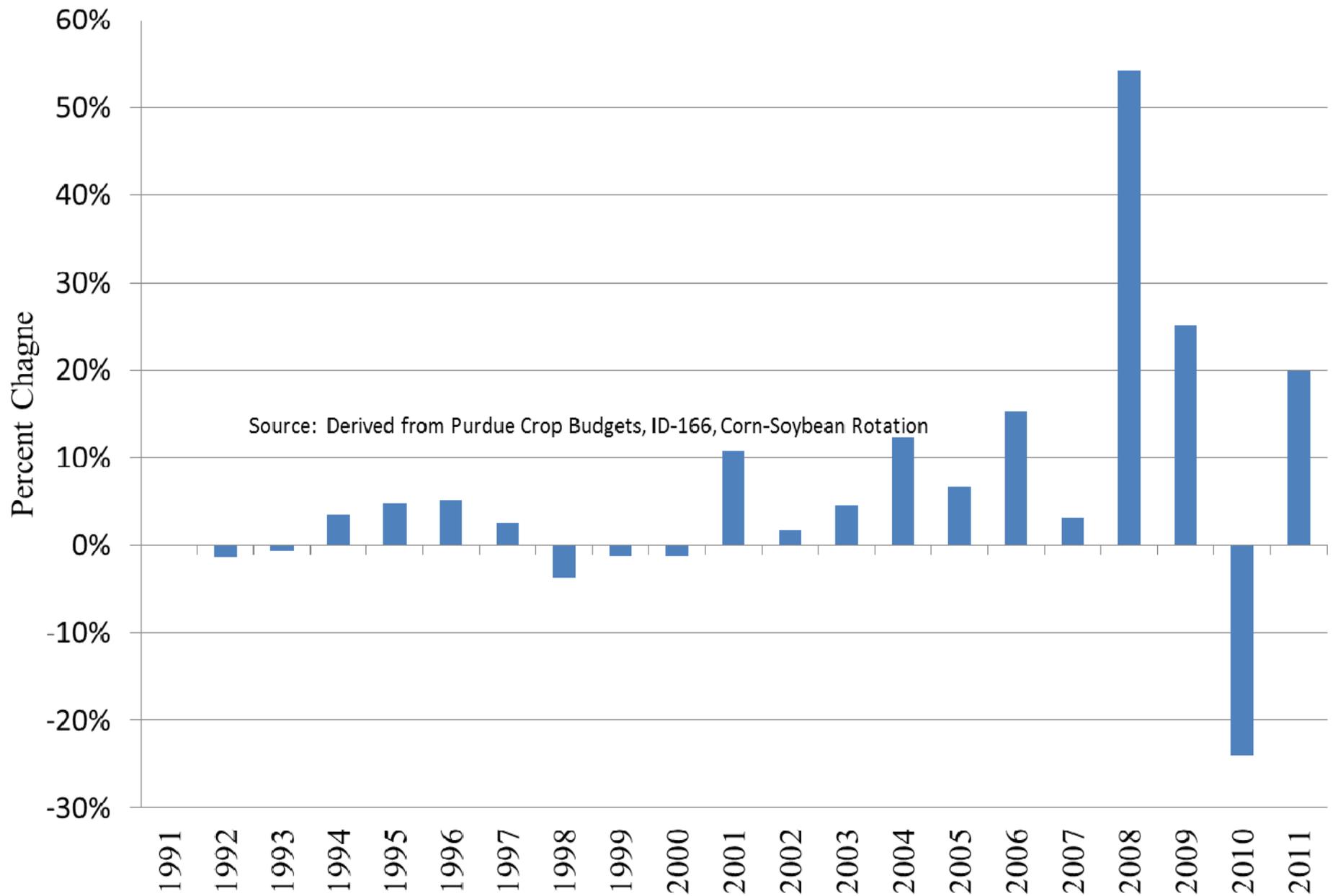
Budgeted Profit and Loss for High Quality Indiana Farmland, 1991-2011



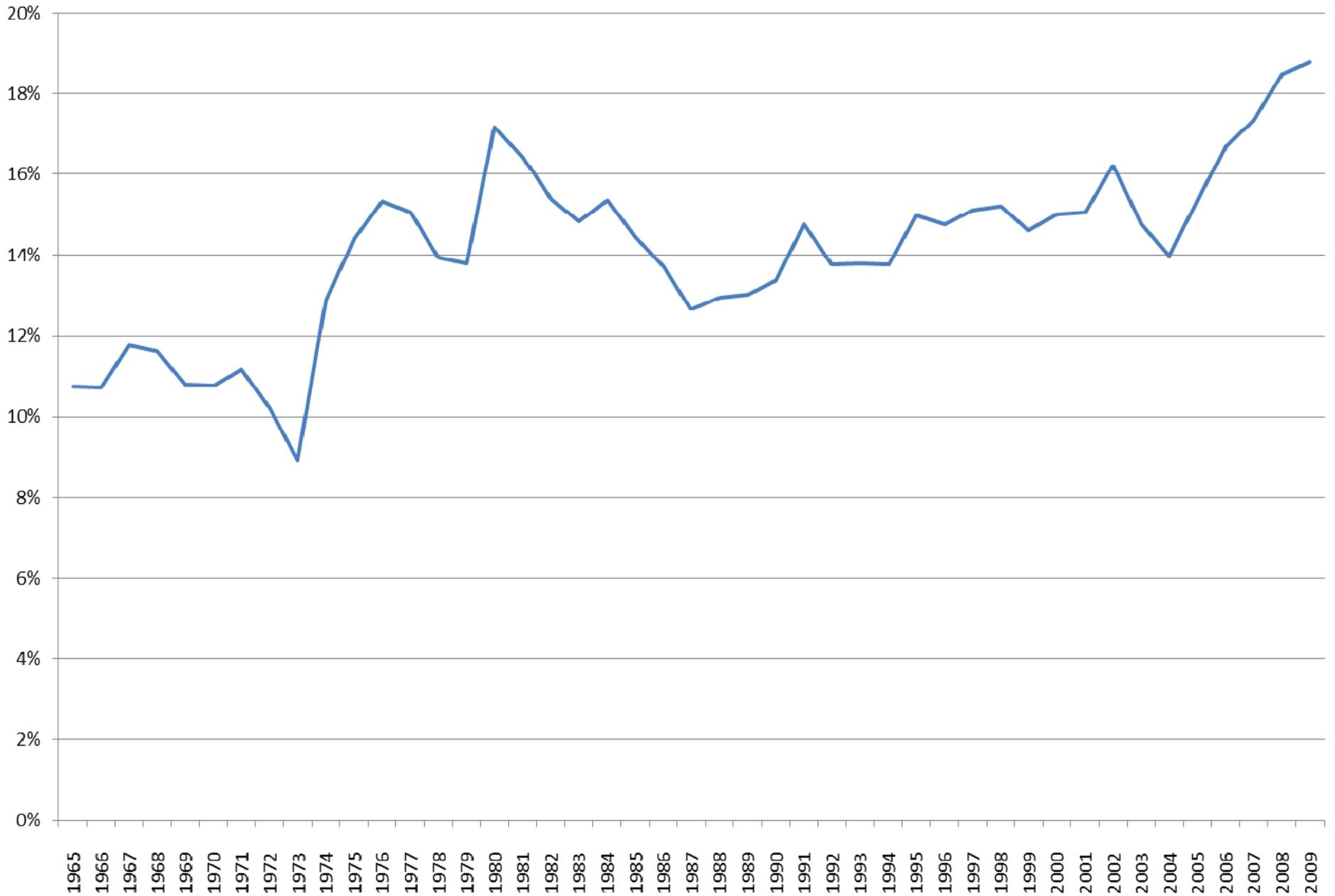
Budgeted Fertilizer, Seed, and Chemical Expenses for High Quality Indiana Farmland, 1991-2011



Percent Change in Budgeted Fertilizer, Seed, and Chemical Expenses for High Quality Indiana Farmland, 1991-2011



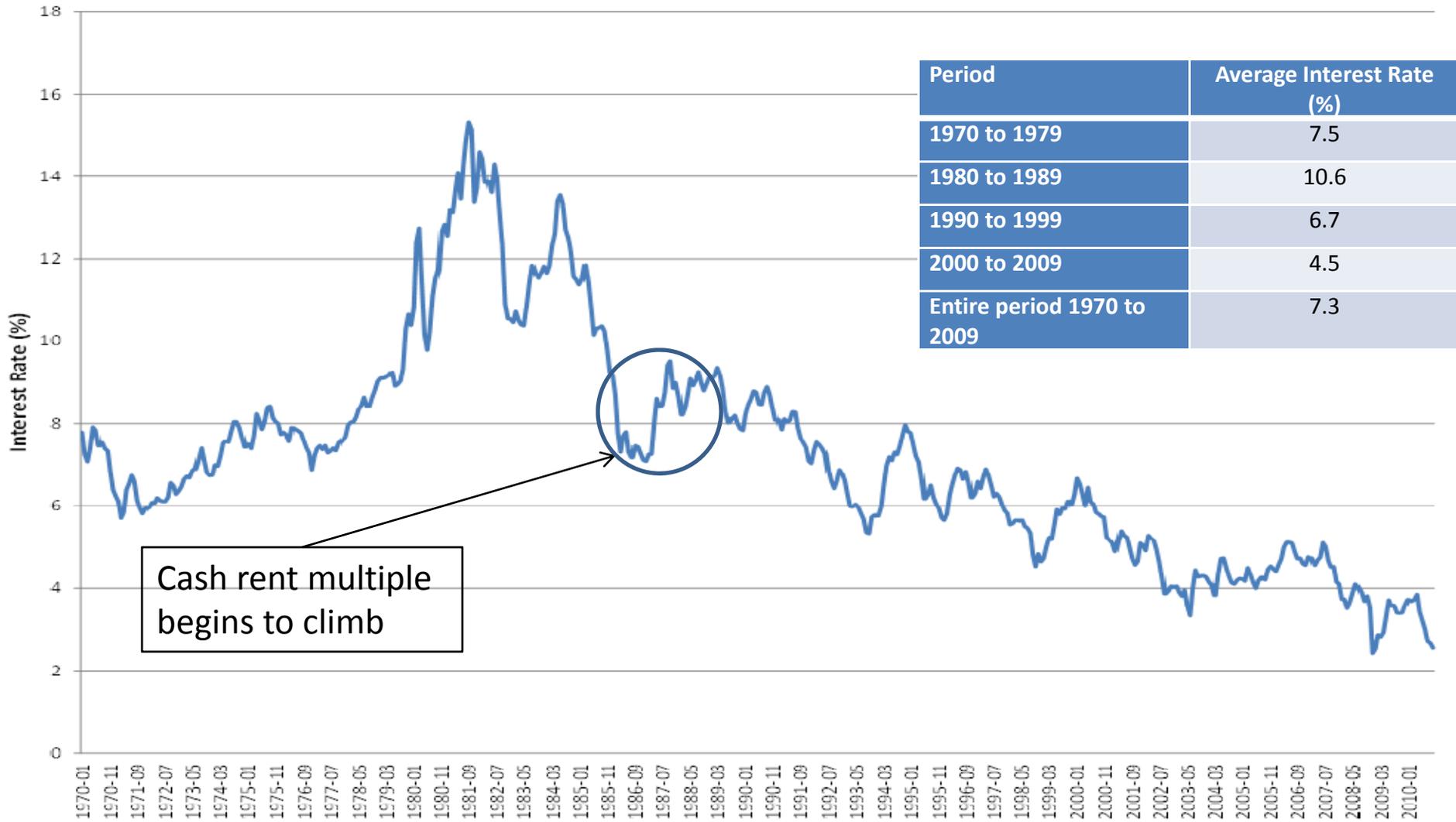
Fertilizer, Seed, Chemical, and Energy as a Percent of Gross Receipts, U.S. Farm Sector, 1965-2009



Many Factors Underlie the High Rent-to-Value Ratio

- Interest rates have gone down dramatically over roughly the same period that the multiple has increased
 - Recall denominator is the discount rate less growth expectations
 - Discount rate approximately equal to risk free return + risk premium, i.e., cap rate is:
Cap rate = Risk free return + risk premium - growth

Interest Rate on 10-Year Treasury Bonds, 1970 to 2010



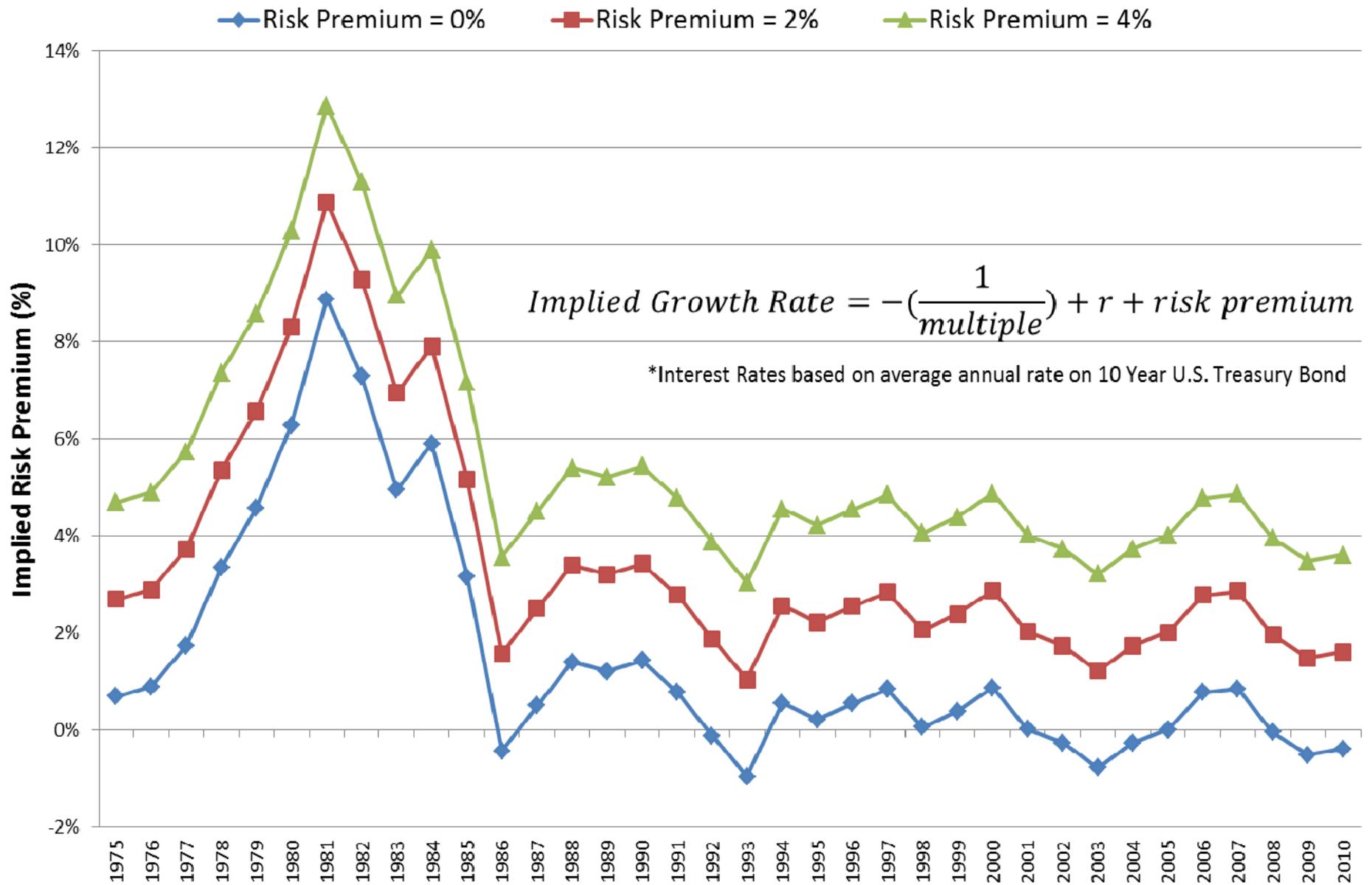
Many Factors Underlie the High Rent-to-Value Ratio

- Interest rates have gone down dramatically over roughly the same period that the multiple has increased
 - Has reduced risk free return component of cap rate
 - What has happened to risk premium component?
- Incomes strong and growing
 - Are cash rent surveys reflective of income?
 - Could reflect high levels of growth expectations

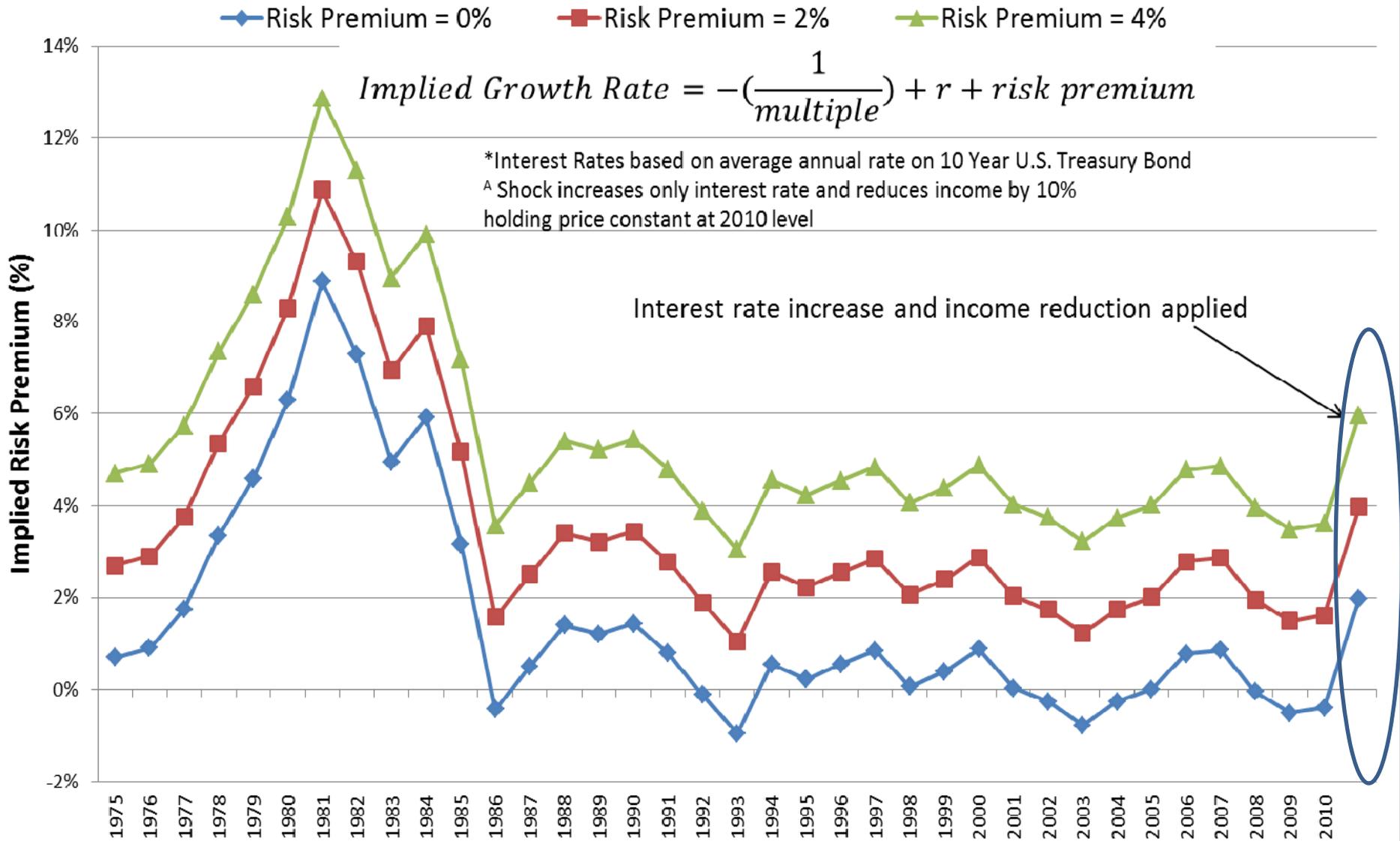
Capitalization Rates

$$\text{Risk Free Rate} + \text{Risk Premium} - \text{Growth Rate} = \text{Capitalization Rate}$$

Implied Income Growth Under Various Risk Premium Assumptions, Average Quality IN Farmland, 1975-2010*



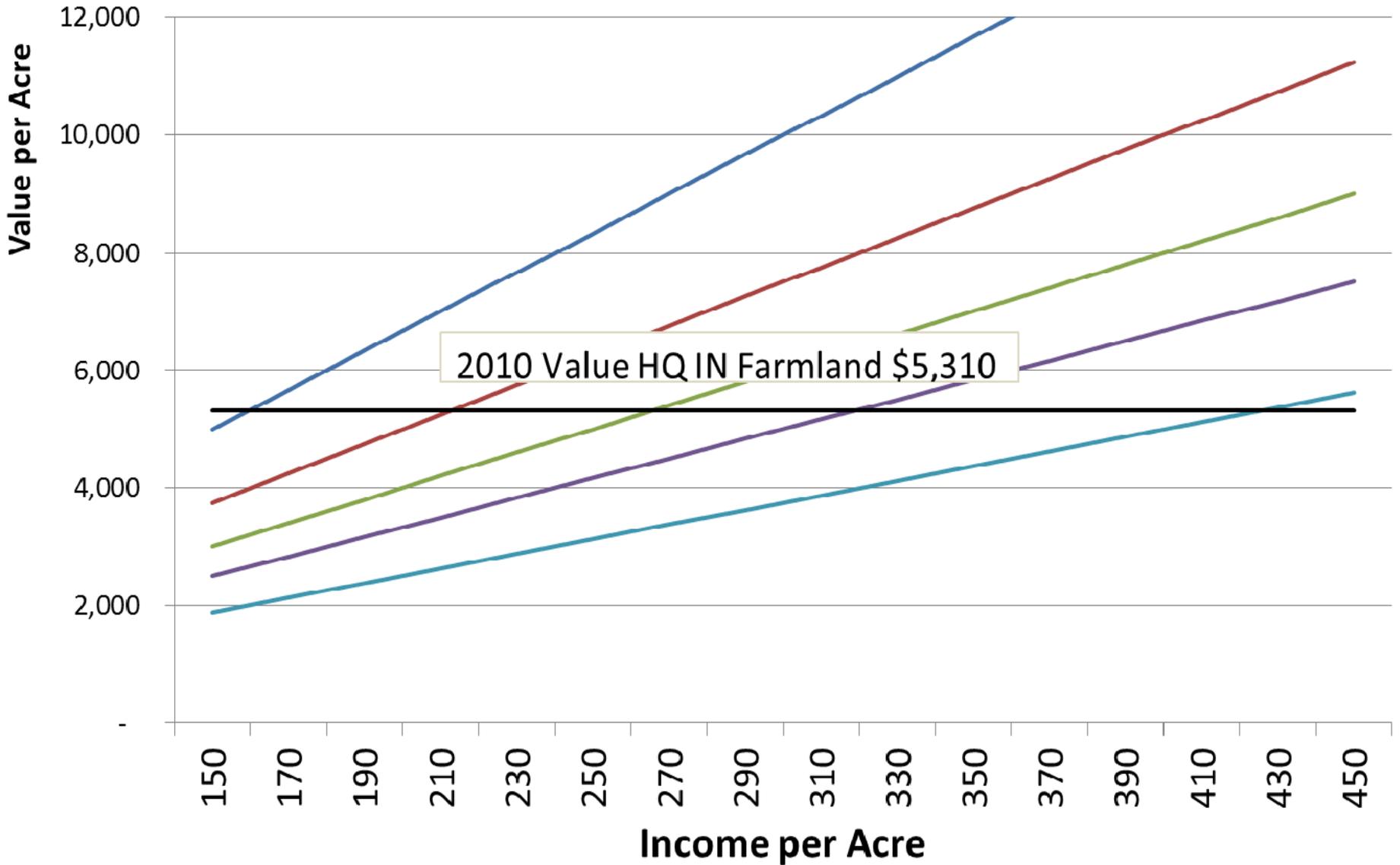
Growth Needed in Future for 200 BP Interest Rate Increase and 10% Income Level Reduction *



Some Scenarios

Land Values Under Alternative Capitalization Rates (Multiples) and Income Levels

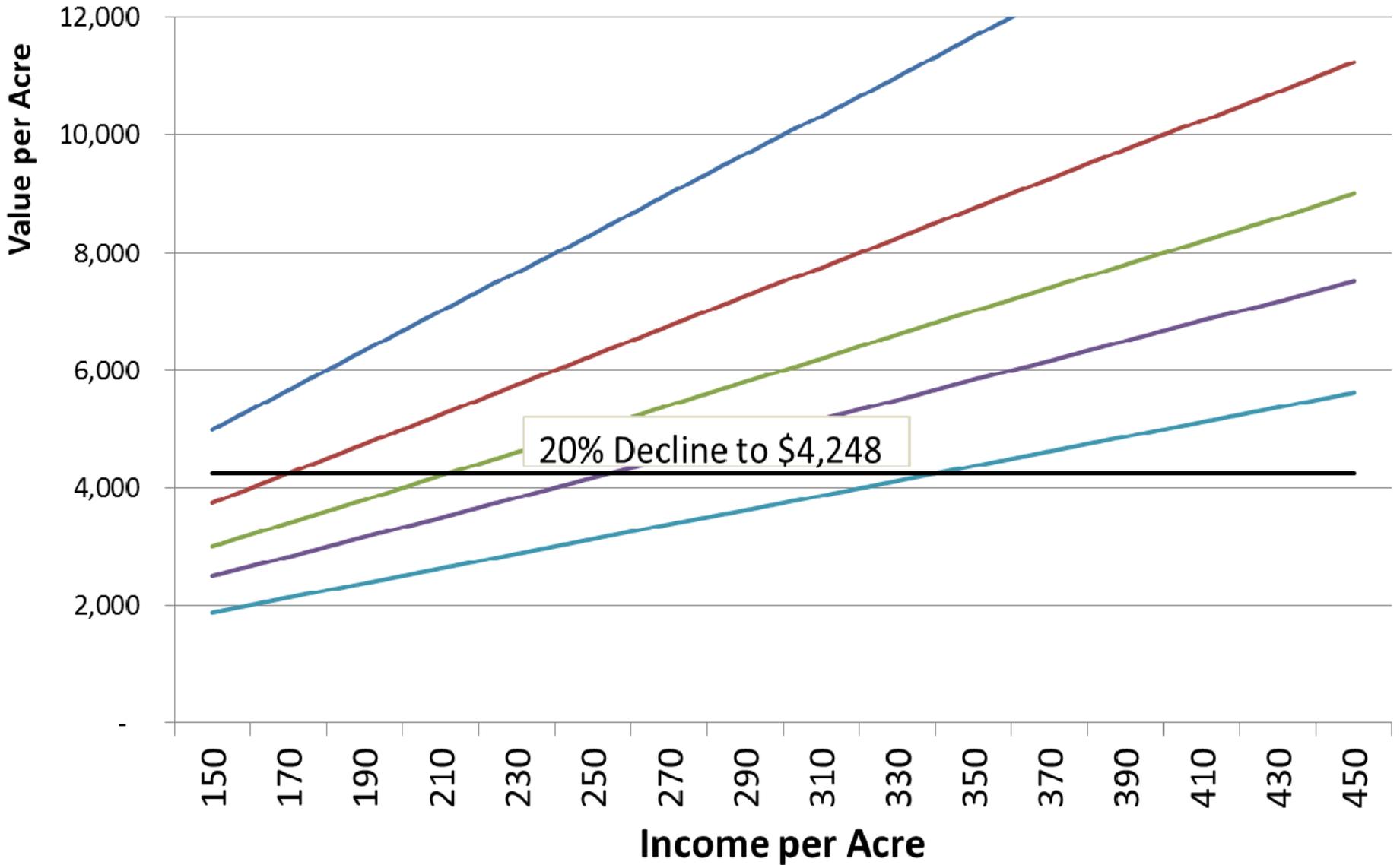
3% (33) 4% (25) 5% (20) 6% (17) 8% (13)



2010 Value HQ IN Farmland \$5,310

Land Values Under Alternative Capitalization Rates (Multiples) and Income Levels

— 3% (33) — 4% (25) — 5% (20) — 6% (17) — 8% (13)



Current Land Values

- Land Values appear to reflect current high returns in agriculture
 - Not obviously overvalued, do not appear to have diverged from reality
 - This DOES NOT mean that a downward movement is impossible
- Values are dependent upon interest rates remaining low or sustained growth in agricultural incomes
- It is possible that a bubble is in early stages of formation
- Little evidence to support argument that the share of return going to land should increase
- Increases from here would be based upon optimistic scenarios for future growth and/or reduced real rates

Key Questions

- What factors would potentially stimulate bubble formation?
- What factors would reduce land values from current levels?
 - How likely are these factors?

Factors that Could Stimulate Bubble Formation

- The wealth effect starts operating in ag
 - Borrowing based “consumption” and investment backed by high net worth – treating land values as the ATM
 - Accommodative lending practices
- Continued high levels of uncertainty over crop returns
 - Price spikes based on confluence of demand growth, weather events, and geopolitical influences
- Continued low rates
- Market value balance sheet updates based on limited market transactions

Risk Matrix for Land Value 1-5 Years

Large Increase	U.S. Inflation Takes Off				
	U.S. Drought		Significant Outside Inv. Surfaces	China Buys U.S. Corn	China Growth Story Continues
Impact	Export Controls Spike Commodity Prices				
	U.S. Double Dips				
		Low	Probability		High
Large Reduction	M.E. Turmoil Spreads			Risk Premium Returns to Land Mkt	Ag Input Costs Rise Rapidly – Margins return to “normal”
		Oil Price Spike Causes Global Recession	USDA CRP Release		200+ bp increase in interest rates
	Forced Sales Due to CF Crisis			U.S. Relaxes Bio-fuel Mandate	
	China Meltdown				

Summary

- The risks to farmland values are highly non-linear
 - We are operating in the tails of the distribution
 - Do not get there with just one or two trends
 - These confluence of events make projecting income difficult
 - Set the stage for bubble formation
- There is great uncertainty about the level at which farmland will trade in 5 years
- It is not clear to me that on balance land is dramatically overvalued at present
 - That can change rapidly

Questions?

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