Crop and Livestock Price Prospects for 2010

Darrel Good
University of Illinois
d-good@illinois.edu
U.S Corn Production

Year | Billion Bushels
--- | ---
79  | 7.9
81  | 8.1
83  | 8.3
85  | 8.5
87  | 8.7
89  | 8.9
91  | 9.1
93  | 9.3
95  | 9.5
97  | 9.7
99  | 9.9
01  | 10.1
03  | 10.3
05  | 10.5
07  | 10.7
09  | 10.9

2009 Illinois Farm Economics Summit
Ending Stocks of Corn

million bushels

2009 Illinois Farm Economics Summit
US Soybean Production

2009 Illinois Farm Economics Summit
US Soybean Acres Planted
Average Farm Price of Soybeans

$/bu.
Ending Stocks of Wheat

million bushels

79 81 83 85 87 89 91 93 95 97 99 01 03 05 07 09

2009 Illinois Farm Economics Summit
US Wheat Acres Planted

2009 Illinois Farm Economics Summit
Average Farm Price of Wheat
Commercial Pork Production

Million Pounds


13,000 14,000 15,000 16,000 17,000 18,000 19,000 20,000 21,000 22,000 23,000 24,000

2009 Illinois Farm Economics Summit
Steer and Heifer Prices

$/cwt.

Year

2010: Farm Returns at a Cross Roads

Gary Schnitkey
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University of Illinois
Outline

- Crop returns in 2009 and 2010
  - Focus on costs
  - Focus on energy and fertilizer costs

- Income projections for 2009
Operator Returns, Cash Rent High—Productivity Farmland, Central Illinois

Source: Illinois Farm Business Farm Management

2009 Illinois Farm Economics Summit
## Direct Costs, Central Illinois ($ per acre)

<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corn</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer</td>
<td>$124</td>
<td>$170</td>
<td>$95</td>
<td>$42</td>
<td>$85</td>
<td>$50</td>
</tr>
<tr>
<td>Pesticides</td>
<td>46</td>
<td>50</td>
<td>50</td>
<td>28</td>
<td>30</td>
<td>30</td>
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<tr>
<td>Seed</td>
<td>67</td>
<td>95</td>
<td>100</td>
<td>43</td>
<td>53</td>
<td>55</td>
</tr>
<tr>
<td>Drying</td>
<td>19</td>
<td>75</td>
<td>19</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Storage</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Crop Insurance</td>
<td>27</td>
<td>27</td>
<td>27</td>
<td>18</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$294</td>
<td>$428</td>
<td>$302</td>
<td>$137</td>
<td>$192</td>
<td>$159</td>
</tr>
</tbody>
</table>

Source: Illinois Farm Business Farm Management
Fertilizer Prices in Illinois

- **Anhydrous ammonia**
- **Potash**
- **DAP**

Source: Agricultural Marketing Service

2009 Illinois Farm Economics Summit
Wholesale Ammonia Prices, Mid Corn Belt

Source: Green Markets
Anhydrous Ammonia, Natural Gas Prices

- Natural Gas, Wellhead Price
- Anhydrous Ammonia, Mid Corn Belt, Wholesale Price

Graph showing the price trends of natural gas and anhydrous ammonia from January 2000 to January 2009.
### Crude Oil Prices

<table>
<thead>
<tr>
<th></th>
<th>Cash Price</th>
<th>CME Futures Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Feb 2010</td>
</tr>
<tr>
<td>Crude Oil</td>
<td>77.19</td>
<td>75.91</td>
</tr>
<tr>
<td>($ per barrel)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Natural Gas</td>
<td>4.67</td>
<td>5.51</td>
</tr>
<tr>
<td>($ per cu. Ft)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prices taken on December 2009.

Crude oil prices at Cushing Oklahoma
Natural gas prices at Henry Hub, Louisiana

Upside potential in energy prices
## Corn and Soybean Budgets, Central Illinois

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yield</strong></td>
<td>199</td>
<td>200</td>
<td>192</td>
<td>50</td>
<td>55</td>
<td>52</td>
</tr>
<tr>
<td><strong>Price</strong></td>
<td>$4.00</td>
<td>$3.85</td>
<td>$4.00</td>
<td>$10.15</td>
<td>$9.90</td>
<td>$10.10</td>
</tr>
<tr>
<td><strong>Revenue</strong></td>
<td>$853</td>
<td>$839</td>
<td>$792</td>
<td>$558</td>
<td>$573</td>
<td>$549</td>
</tr>
<tr>
<td><strong>Direct cost</strong></td>
<td>$294</td>
<td>$428</td>
<td>$302</td>
<td>$137</td>
<td>$192</td>
<td>$159</td>
</tr>
<tr>
<td><strong>Power costs</strong></td>
<td>82</td>
<td>84</td>
<td>81</td>
<td>70</td>
<td>70</td>
<td>69</td>
</tr>
<tr>
<td><strong>Overhead costs</strong></td>
<td>52</td>
<td>55</td>
<td>57</td>
<td>46</td>
<td>50</td>
<td>52</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td>$462</td>
<td>$567</td>
<td>$440</td>
<td>$253</td>
<td>$312</td>
<td>$280</td>
</tr>
<tr>
<td><strong>Opr and Land Return</strong></td>
<td>$425</td>
<td>$272</td>
<td>$352</td>
<td>$305</td>
<td>$222</td>
<td>$300</td>
</tr>
</tbody>
</table>

Source: Illinois Farm Business Farm Management
Figure 1. Average Cash Rent by County, 2008.

Source: National Agricultural Statistical Service, U.S. Department of Agriculture

2009 Illinois Farm Economics Summit
## Cash Rents in Illinois

<table>
<thead>
<tr>
<th>Year</th>
<th>Illinois (USDA)</th>
<th>Percent Change</th>
<th>FBFM Farms in Northwest IL. ($) per acre</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cash Rent ($ per Acre)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>119</td>
<td>0.0%</td>
<td>126</td>
</tr>
<tr>
<td>2002</td>
<td>122</td>
<td>2.5%</td>
<td>128</td>
</tr>
<tr>
<td>2003</td>
<td>123</td>
<td>0.8%</td>
<td>131</td>
</tr>
<tr>
<td>2004</td>
<td>126</td>
<td>2.4%</td>
<td>134</td>
</tr>
<tr>
<td>2005</td>
<td>129</td>
<td>2.4%</td>
<td>135</td>
</tr>
<tr>
<td>2006</td>
<td>132</td>
<td>2.3%</td>
<td>140</td>
</tr>
<tr>
<td>2007</td>
<td>141</td>
<td>6.8%</td>
<td>152</td>
</tr>
<tr>
<td>2008</td>
<td>163</td>
<td>15.6%</td>
<td>155</td>
</tr>
<tr>
<td>2009</td>
<td>170</td>
<td>4.3%</td>
<td>161 *</td>
</tr>
</tbody>
</table>

* Preliminary based on 4.3% increase
For the Northwest region from 2009 Land Values booklet

Excellent Productivity $215
Average Productivity $190
Fair Productivity $165
Expectations for 2010

- Mid-year survey of Illinois Society members
- Expect a slight decline in cash rents of $10 to $15

- Note: Society members have rents that are above average and more in keeping with the market. I doubt the average will decline.
Farm income projections

- Projections made with a sample of 680 farms
  - Slightly over 1,000 acre average farm size
  - Estimated end of year prices of
    - Corn: $4.00
    - Soybeans: $10.10
    - Wheat: $4.10
### Average Net Farm Income

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>$93,000</td>
</tr>
<tr>
<td>2005</td>
<td>$58,000</td>
</tr>
<tr>
<td>2006</td>
<td>$95,000</td>
</tr>
<tr>
<td>2007</td>
<td>$198,000</td>
</tr>
<tr>
<td>2008</td>
<td>$202,000</td>
</tr>
<tr>
<td>2009</td>
<td>$75,000 ***</td>
</tr>
</tbody>
</table>

Net income from 2004 through 2008 are actual.

Income in 2009 in projected
Net income will be variable

- **Tenure**
  - Those farms with higher percent of farmland cash rented will have lower incomes

- **Timing of input purchases**
  - Those farms that purchased early will have lower incomes

- **Crop marketing**
Roller coaster of returns continues

2009 could have been worse had we seen prices
Speculation and Price Volatility: Implications for Farmer Marketing

Scott Irwin
sirwin@illinois.edu
University of Illinois
Price Volatility Adds to Worry on U.S. Farms

Fred Credar, a farmer near Bloomington, Ill., has more to worry about these days than hard work, crops and rain. If the market for commodities turns the wrong way, he could be wiped out.

By DIANA B. HENRIQUES
Published April 22, 2008

Rising Prices, Rockier Markets

The increased volatility of grain futures prices is making it harder and more expensive for farmers to hedge their risks.

FUTURES CONTRACT PRICE
Prices per bushel, shown on comparable percentage change scales.

<table>
<thead>
<tr>
<th></th>
<th>Corn</th>
<th>Soybeans</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>'06</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>'07</td>
<td>4</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>'08</td>
<td>2</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

IMPLIED VOLATILITY
Implied volatility measures the volatility expected by traders, based on trading in options on the commodities.

<table>
<thead>
<tr>
<th></th>
<th>Corn</th>
<th>Soybeans</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>'06</td>
<td>50%</td>
<td>50%</td>
<td></td>
</tr>
<tr>
<td>'07</td>
<td>40%</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>'08</td>
<td>30%</td>
<td>30%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Source: Bloomberg
As Oil Rises, More Speculating About Speculators
JUNE 30, 2008, 10:25 AM

MARKET MAKER
Energy Speculators Draw the Heat

Are Pension Funds Fueling High Oil?
A Senate hearing weighs charges that speculation by big investors and sovereign wealth funds is behind the rise in commodities and energy prices.

The Role of Speculators in the Global Food Crisis
By Beat Balzli and Frank Hornig

Vast amounts of money are flooding the world's commodities markets, driving up prices of staple foods like wheat and rice. Biofuels and droughts can't fully explain the recent food crisis -- hedge funds and small investors bear some responsibility for global hunger.
4 months ago: WASHINGTON - JUNE 24: Michael Masters (L), of Masters Capital Management, LLC, testifies while Walter Lukken (R), Chairman U.S. Commodity Futures Trading Commission, and Dr. James Niesome (C), President and Chief Executive Officer NYMEX, listen during a Senate Homeland Security and Governmental Affairs hearing on Capitol Hill, June 24, 2009 in Washington D.C. The Committee is hearing testimony excessive speculation in the common markets.

CFTC Chairman Gary Gensler, right, speaks with SEC Chairman Mary Schapiro before a Senate Banking subcommittee hearing on oversight of the derivatives market June 22.
A New Type of Commodity Speculator

Commodity Index Investors
- Desire portfolio exposure to long-only returns from a basket of commodities
- Pension funds and institutional investors

Popular Indexes
- GSCI
- Dow Jones-AIG
- Reuters/Jeffries-CRB

Investment Types
- OTC index funds
- Exchange-traded funds
- Exchange-traded notes
The World According to Mr. Masters

Chart 1. S&P GSCI Spot Price Index vs. Index Speculator Assets

Chart 2. Commodities Futures Market Size (Billions) vs. S&P GSCI
Supplies of physical commodities are constrained in the short-run.

Unleveraged futures positions of index funds are effectively “synthetic” long positions in physical commodities, and hence, represent new “demand.”

If the magnitude of index fund “demand” is large enough relative to physical supply, prices and price volatility can skyrocket.

**Bottom-line:** index fund investment is “too big” for the size of existing commodity futures markets.
Conceptual Error#1: Money Flows are not Necessarily the Same as Demand

- Futures markets are zero-sum games
- If long positions of index funds are new “demand” then the short positions for the same contracts are new “supply”? 
- With equally informed market participants, there is no limit to the number of futures contracts that can be created at a given price level

“...for every long there is a short, for everyone who thinks the price is going up there is someone who thinks it is going down, and for everyone who trades with the flow of the market, there is someone trading against it.”

Tom Hieronymus
**Conceptual Error#2: Index Futures Positions Distort both Cash and Futures Prices**

- Futures contracts are financial transactions that only rarely involve the actual delivery of physical commodities (i.e. “side bets”)
- To impact the equilibrium price of commodities in the cash market over all but very short time intervals, index funds must take delivery and/or buy quantities in the cash market and hold these inventories off the market
- Absolutely no evidence that index funds took delivery of commodities
Inconsistent Fact #1: Inventories did not Increase for Storable Commodities

Ending Stocks as a Percent of Use, 2001/02-2007/08

"So my challenge to people who say there’s an oil bubble is this: let’s get physical. Tell me where you think the excess supply of crude is going.”
### Inconsistent Fact #2: Speculation was not Excessive Compared to Hedging (2006:I-2008:I Averages)

<table>
<thead>
<tr>
<th></th>
<th>Long Hedging</th>
<th>Short Hedging</th>
<th>Long Speculation</th>
<th>Short Speculation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Corn</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>328,362</td>
<td>654,461</td>
<td>558,600</td>
<td>208,043</td>
</tr>
<tr>
<td>2008</td>
<td>598,790</td>
<td>1,179,932</td>
<td>792,368</td>
<td>182,291</td>
</tr>
<tr>
<td>Change</td>
<td>270,428</td>
<td>525,471</td>
<td>233,768</td>
<td>-25,752</td>
</tr>
<tr>
<td><strong>Soybeans</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>126,832</td>
<td>192,218</td>
<td>183,105</td>
<td>107,221</td>
</tr>
<tr>
<td>2008</td>
<td>175,973</td>
<td>440,793</td>
<td>351,379</td>
<td>74,844</td>
</tr>
<tr>
<td>Change</td>
<td>49,141</td>
<td>248,575</td>
<td>168,274</td>
<td>-32,377</td>
</tr>
<tr>
<td><strong>Wheat</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>57,942</td>
<td>213,278</td>
<td>251,926</td>
<td>92,148</td>
</tr>
<tr>
<td>2008</td>
<td>70,084</td>
<td>240,864</td>
<td>300,880</td>
<td>121,578</td>
</tr>
<tr>
<td>Change</td>
<td>12,141</td>
<td>27,585</td>
<td>48,954</td>
<td>29,430</td>
</tr>
</tbody>
</table>
Inconsistent Fact #3: Price Increases Did not Occur in All Commodity Futures Markets Included in Popular Indexes (January 3, 2006 – April 15, 2008)
The Debate Continues

- Conceptual problems and inconsistent facts build a reasonably strong case against bubbles in commodity prices
- Unpersuasive to those who think this was a unique market episode
- Temporal relationship between index fund investment and commodity price movements just seems so obvious!

Chart 1. S&P GSCI Spot Price Index vs. Index Speculator Assets

2009 Illinois Farm Economics Summit
Testing the Bubble Hypothesis

![Cartoon of a mother and children looking at a computer screen with text: "Correlation does not imply causation."]

![Graph showing the relationship between fresh lemons imported to the USA from Mexico (Metric Tons) and total US highway fatality rate from 1996 to 2000. The graph includes data points for 1996, 1997, 1998, 1999, and 2000. The R² value is 0.97. Sources: U.S. NHTSA, DOT HS 810 780, U.S. Department of Agriculture.]

Sources:
- U.S. NHTSA, DOT HS 810 780
- U.S. Department of Agriculture
Commodity Index Trader Percentage of Total Corn Open Interest and Nearby CBOT Corn Futures Price, January 2004-August 2009
Commodity Index Trader Percentage of Total Corn Open Interest and Nearby CBOT Soybean Futures Price, January 2004-August 2009
Commodity Index Trader Percentage of Total Corn Open Interest and Nearby CBOT Wheat Futures Price, January 2004-August 2009

CIT % Open Interest (left scale)

Futures Price (right scale)
scapegoat

SYLLABICATION: scape·goat

PRONUNCIATION: skāp′gōt′

NOUN: 1. One that is made to bear the blame of others. 2. Bible A live goat over whose head Aaron confessed all the sins of the children of Israel on the Day of Atonement. The goat, symbolically bearing their sins, was then sent into the wilderness.

TRANSITIVE VERB: Inflected forms: scape·goat·ed, scape·goat·ing, scape·goats
To make a scapegoat of.

ETYMOLOGY: scape^2 + goat (translation of Hebrew ʾez ʿōzēl, goat that escapes, misreading of ʾāzāʾ ʿōzēl, Azazel).
High price volatility may limit the forward contracting opportunities offered by grain merchandisers
- Shorter time horizons
- Weak basis levels
- More erratic basis behavior
Predictability of CBOT Corn Basis Change to First Day of Delivery with all Delivery Locations Pooled, December 2001 – May 2008 Contracts

Dec 2001- Dec 2005
\[ y = -0.87x - 0.61 \]
\[ R^2 = 0.87 \]

Mar 2006-May 2008
\[ y = -0.62x - 6.63 \]
\[ R^2 = 0.28 \]

Note: September 2005 observations omitted
Alternatives to Forward Contracting

- Direct use of futures hedging
  - Margin risk
  - Basis risk
- Direct use of options hedging
  - Initial premium outlay may be large
  - Basis risk
- Basis contract + futures hedge
- Contract with a grain user (e.g., ethanol plant)
  - Default risk
- Increase crop revenue insurance coverage
Climate Change Policy & Agriculture

A. Bryan Endres
bendres@illinois.edu
University of Illinois

2009 Illinois Farm Economics Summit
The Profitability of Illinois Agriculture: Profitability at a Crossroads
Sea Ice & Temperature

September 1979

September 2007

Figure 4.2: Annual Global Mean Temperatures (black dots) with Linear Fits to the Data.

Source: Solomon et al. (2007). The left-hand axis shows temperature anomalies relative to the 1961 to 1990 average, and the right-hand axis shows estimated actual temperatures, both in Celsius. Linear trends are shown for the last 25 (yellow), 50 (orange), 100 (magenta), and 150 years (red). The smooth blue curve shows decadal variations with the decadal 90% error range shown as a pale blue band about that line. The total temperature increase from the period 1860 to 1899 to the period 2001 to 2005 is 1.3°F ± 0.3°F (0.76°C ± 0.19°C).


Climate Change & Weather


For each plant variety, there is an optimal temperature for vegetative growth, with growth dropping off as temperatures increase or decrease. Similarly, there is a range of temperatures at which a plant will produce seed. Outside of this range, the plant will not reproduce. As the graphs show, corn will fail to reproduce at temperatures above 95°F and soybean above 102°F.

Potential Impact on Agriculture

- Potential benefit in near term for some grains/oilseeds due to elevated CO₂ levels and warmer temperatures
  - Elevated ozone levels may negate yield benefits
  - Increased risk of “extreme” events—heat, drought
  - Potential for increased pests/weeds

- Potential adverse affect to livestock management and irrigation

Source: EPA Endangerment Finding (Dec. 7, 2009)
U.S. GHG Emissions by Sector

CO$_2$e & Global Warming Potential

Primary Greenhouse Gases
- Carbon Dioxide (CO$_2$)
- Methane (CH$_4$)
- Nitrous Oxide (N$_2$O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF$_6$)

1 Kg of CO$_2$ has a GWP of 1, with all other GHGs measured against the CO$_2$ baseline to create CO$_2$e
Methane Emissions by Source

Nitrous Oxide Emissions

**CO₂ Flux (Sequestration)**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1990</td>
<td>2006</td>
<td>2007</td>
</tr>
<tr>
<td>Estimated Sequestration (Million Metric Tons CO₂e)</td>
<td>96.3</td>
<td>44.5</td>
<td>45.1</td>
</tr>
<tr>
<td>Change from 1990 (Million Metric Tons CO₂e)</td>
<td>-51.8</td>
<td>-51.2</td>
<td></td>
</tr>
<tr>
<td>(Percent)</td>
<td>-53.8%</td>
<td>-53.2%</td>
<td></td>
</tr>
<tr>
<td>Average Annual Change from 1990 (Percent)</td>
<td>-4.7%</td>
<td>-4.4%</td>
<td></td>
</tr>
<tr>
<td>Change from 2006 (Million Metric Tons CO₂e)</td>
<td>0.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Percent)</td>
<td>1.4%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Figure 31. Carbon Sequestration in U.S. Croplands and Grasslands, 1990-2007**

Trading of carbon credits created outside of a legal mandate based on contractual relationships

- E.g., Chicago Climate Exchange (CCX)

Total CCX Offsets (tons CO$_2$e)

- Agricultural Methane: 1,406,300
- Agric. Soil Carbon: 21,679,100
- Forestry: 11,223,800

Future of CCX hinges on “cap & trade” rules
Key Legal Developments

- Mandatory GHG Reporting Rule (Oct. ’09)
  - Proposed GHG permitting requirements for New Source Review (NSR) and Title V operating permits for large facilities (Oct. ’09)
  - Prevention of Significant Deterioration (PSD) program reconsideration (Oct. ’09)
  - GHG Endangerment Finding (Dec. ’09)
- H.R. 2454, American Clean Energy & Security Act (Cap & Trade bill)
- Renewable Fuel Standard (RFS2) Rules (May ’09)
Mandatory GHG Reporting Rule


Purpose
- Collect accurate emissions data to inform future policy

Timing

Scope
- Facilities with 25,000 metric tons CO$_2$e/year
  - 85% of U.S. emissions / 10,000 facilities
  - Includes approximately 107 livestock facilities
- Exempts all other agric. operations & food processing
Massachusetts v. EPA (2007)

• Supreme Court rules that GHGs are “air pollutants” covered by the CAA
  • EPA required to determine if GHGs from new motor vehicles contribute to air pollution, which may endanger public health or welfare (endangerment finding)
  • Domino effect
    • If issue “endangerment” finding, then may regulate GHGs from new motor vehicles
    • Regulation of GHGs from new motor vehicles will trigger additional GHG regulations
Proposed GHG permits for NSR & Title V operating permits

• 74 Fed. Reg. 55292 (Oct. 27, 2009)

• Purpose:
  • Mandate emissions control requirements / best available control technologies at large industrial facilities

• Scope:
  • New / modified facilities with 25,000 metric tons CO2e/year
  • EPA could later lower permit thresholds
  • No explicit agricultural exemption

• Issued in conjunction with proposal to revise PSD regulations to include GHGs (74 Fed. Reg. 51535)
GHG Endangerment Finding

- Issued Dec. 7, 2009
- Finding:
  - Six GHGs endanger both the public health and public welfare of future generations
  - New motor vehicles contribute to GHG air pollution
- Rule effective 30 days after publication in Federal Register
- Supports the Sept. 15, 2009 proposed rule to limit GHGs / improve fuel economy to 35.5 mpg
- Title I & II: Clean Energy & Efficiency Incentives
- Title III: “Caps” certain GHG emissions
  - 17% reduction from 2005 levels by 2020
  - 83% reduction from 2005 levels by 2050
  - Rules and allowances set by EPA
  - Ability to “trade” emission allowances/offset credits
- Title V: Exempts all agricultural activities from “cap”
  - Rules for offsets set by USDA (not EPA)
    - USDA projects a net annualized annuity benefit of $22 billion to agriculture industry; 30% of benefit to Corn Belt
- Preempt EPA Clean Air Act GHG regulations
Renewable Fuel Standard

Volumes of Renewable Fuel

Energy Independence; Support Rural Economics; Reduce GHG Emissions
Concluding Thoughts

- Federal government likely to take significant steps to regulate GHG emissions in 2010
- Medium to long term potential input price increases from GHG regulation under “cap & trade” or Clean Air Act rules
- Agriculture may have significant opportunities to diversify farm income via GHG offset trading under “cap & trade” regime
- Bioenergy mandates unlikely to change and low carbon fuel requirements will support diversified agricultural operations
Using ACRE and Crop Insurance to Manage Risk

Nick Paulson
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University of Illinois

2009 Illinois Farm Economics Summit
The Profitability of Illinois Agriculture: Profitability at a Crossroads
The 2009 Crop Year

There seems to be some question as to who is in charge here.

© Original Artist
MYA Corn Price Projections

USDA 2009/10 MYA Corn Price Projections
May - November 2009

- Low
- Midpoint
- High
- ACRE Trigger

2009/10 MYA Price
$5.00
$4.75
$4.50
$4.25
$4.00
$3.75
$3.50
$3.25
$3.00
$2.75

May June July August September October November

2009 Illinois Farm Economics Summit
## ACRE Payment Scenarios - Corn

<table>
<thead>
<tr>
<th>2009 IL Yield (bu. per acre)</th>
<th>2009 Season Average Price ($ per bu.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>165</td>
<td>$103</td>
</tr>
<tr>
<td>170</td>
<td>$87</td>
</tr>
<tr>
<td><strong>175</strong></td>
<td><strong>$71</strong></td>
</tr>
<tr>
<td>180</td>
<td>$54</td>
</tr>
</tbody>
</table>
MYA Soybean Price Projections

USDA 2009/10 MYA Soybean Price Projections
May - November 2009

- Low
- Midpoint
- High
- ACRE Trigger

2009/10 MYA Price

May June July August September October November

$11.25 $11.00 $10.75 $10.50 $10.25 $10.00 $9.75 $9.50 $9.25 $9.00 $8.75 $8.50 $8.25 $8.00 $7.75
<table>
<thead>
<tr>
<th>2009 IL Yield (bu. per acre)</th>
<th>2009 Season Average Price ($ per bu.)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$8.20</td>
<td>$9.20</td>
<td>$10.20</td>
</tr>
<tr>
<td></td>
<td>--------- $ per acre ---------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>$88</td>
<td>$47</td>
<td>$6</td>
</tr>
<tr>
<td>43</td>
<td>$72</td>
<td>$29</td>
<td>$0</td>
</tr>
<tr>
<td>45</td>
<td>$56</td>
<td>$11</td>
<td>$</td>
</tr>
<tr>
<td>47</td>
<td>$39</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>
## 2009 Crop Insurance Payments

<table>
<thead>
<tr>
<th>Crop</th>
<th>Base Price</th>
<th>Harvest Price</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn (CRC, GRIP)</td>
<td>$4.04</td>
<td>$3.72</td>
<td>($0.32) (7.9%)</td>
</tr>
<tr>
<td>Corn (RA)</td>
<td>$4.04</td>
<td>$3.90</td>
<td>($0.14) (3.5%)</td>
</tr>
<tr>
<td>Soybeans</td>
<td>$8.80</td>
<td>$9.66</td>
<td>$0.86 9.8%</td>
</tr>
<tr>
<td>Wheat</td>
<td>$8.58</td>
<td>$5.17</td>
<td>($3.41) (39.7%)</td>
</tr>
</tbody>
</table>
2009 Crop Insurance Payments

- Individual plans
  - Yield losses required for corn and soybeans

- Area plans
  - Most likely for corn and soybeans in the Southwest region of IL
  - Large payments on wheat acres, especially in Western region counties

- Effects of delayed harvest

- Future crop years
ACRE and Crop Insurance

- ACRE not a complete substitute for crop insurance
  - Historical revenue index vs. “expected” yield/revenue in a given crop year
  - State vs. county vs. farm yields
  - U.S. season average price vs. futures
  - Insurance units vs. FSA farm id’s

- Farm trigger rules provide incentive to purchase crop insurance
  - Reduces chance of being ineligible when ACRE payments occur
ACRE and Crop Insurance

- **ACRE**
  - state average yields
  - national average prices
  - averages based on last 3-5 years

- **GRIP and GRP**
  - county yields
  - futures prices
  - price changes over growing season
ACRE and Crop Insurance

- **Individual insurance plans cover risk at the farm level**
  - availability of yield and revenue protection
  - farm-level yields
  - futures prices
  - price changes over growing season

- **In any given year**
  - ACRE AND insurance may pay
  - ACRE OR insurance may pay
  - neither may pay
### Historical Analysis - Corn

**Percentage of farms receiving payments**

<table>
<thead>
<tr>
<th>Year</th>
<th>ACRE</th>
<th>85% CRC</th>
<th>85% APH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>0%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>1981</td>
<td>0%</td>
<td>30%</td>
<td>3%</td>
</tr>
<tr>
<td>1982</td>
<td>0%</td>
<td>48%</td>
<td>2%</td>
</tr>
<tr>
<td>1995</td>
<td>0%</td>
<td>49%</td>
<td>49%</td>
</tr>
<tr>
<td>2002</td>
<td>0%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>2004</td>
<td>0%</td>
<td>57%</td>
<td>1%</td>
</tr>
</tbody>
</table>
### Historical Analysis - Soybean

#### Percentage of farms receiving payments

<table>
<thead>
<tr>
<th>Year</th>
<th>ACRE</th>
<th>85% CRC</th>
<th>85% APH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>0%</td>
<td>53%</td>
<td>6%</td>
</tr>
<tr>
<td>1983</td>
<td>0%</td>
<td>61%</td>
<td>61%</td>
</tr>
<tr>
<td>1988</td>
<td>0%</td>
<td>73%</td>
<td>73%</td>
</tr>
<tr>
<td>1991</td>
<td>0%</td>
<td>30%</td>
<td>20%</td>
</tr>
<tr>
<td>1995</td>
<td>0%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>1996</td>
<td>0%</td>
<td>20%</td>
<td>16%</td>
</tr>
<tr>
<td>2003</td>
<td>0%</td>
<td>66%</td>
<td>66%</td>
</tr>
</tbody>
</table>
McLean County

- High productivity/low risk, highly correlated with IL yield
- GRIP payments
  - 9 of 31 years
  - 6 out of the 10 ACRE payment years
- GRP payments
  - 5 of 31 years
  - 3 out of the 10 ACRE payment years
Williamson County

- Lower productivity/higher risk, less correlated with IL yields
- GRIP payments
  - 7 of 31 years
  - 3 out of the 10 ACRE payment years
- GRP payments
  - 6 of 31 years
  - *none* of the 10 ACRE payment years
McLean County

- GRIP payments
  - 7 of 31 years
  - 3 out of the 5 ACRE payment years
- GRP payments
  - 3 of 31 years
  - 1 out of the 5 ACRE payment years
ACRE and Area Plans - Soybean

- **Williamson County**
  - GRIP payments
    - 7 of 31 years
    - 3 out of the 5 ACRE payment years
  - GRP payments
    - 6 of 31 years
    - *none* of the 5 ACRE payment years
Coupling ACRE with yield insurance may offer similar risk reduction at a lower cost than with revenue insurance.

Substitutability considerations:
- Farm-state yield correlation
- Insurance (futures) vs. MYA prices
- Timing of marketing
- Farm yield risk
- Current preferred coverage level
If ACRE is elected - may be able to reduce coverage level within farm-level insurance plans to achieve similar levels of risk reduction

- Premium savings will, in general, offset reduction in direct payments
- Depends on
  - Level of correlation between farm and state yields
  - Farm yield volatility (risk)
  - Current coverage level
ACRE and Area Plans

- ACRE, GRP, and GRIP
  - State vs. county yields
  - Futures vs. MYA prices
  - Amount of overlap depends on correlation between county and state yields
  - Lack of overlap illustrates the price-driven nature of ACRE/GRIP
Questions?
Economic Crisis: Linkages to Agriculture and Farmland Values

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University of Illinois
Where do we start?
GDP = C + I + G - (X - M)

US:
14,266 = 10,140 + 1,569 + 2,959 - 402
71% + 11% + 21% - 3%

Source: BEA 3rd Qtr 2009, estimate, current dollars

China
36% + 42% + 13% + 9%
Financial Health of the Consumer

- Income Declines
  - 15 million unemployed + 11.5 underemployed
  - Average work week 33.2 hours
  - Median unemployment 20.1 weeks (up 100% Nov 2008)

- Wealth declines
  - $3.6 trillion off home price peak
  - $8.3 trillion off financial asset peak values

- 23% of home mortgages have negative equity

- 9.24% mortgages past due (up 44%)
U.S. Savings Rate

China: 30-40%

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Employment

- Underemployed
- Unemployed

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Commercial, Residential and Farm Real Estate Prices

Base = 2000

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U.S. Debt Markets

How markets have changed since the start of the recession

Supported by Government

U.S. Treasuries
Municipal
Agency MBS??
Non-agency MBS
Subprime
Prime jumbo
Option ARM
Alt-A
Commercial
Auto loans
Credit cards
Home equity
Student loans
Commercial paper
Investment grade bonds
Junk bonds
Institutional leveraged loans
Bank loans and leases

Source: WSJ 12/8/2009
The Fed Has Expanded its Balance Sheet to Extend Credit to Banks

Federal Reserve Balance Sheet

- Short-term Lending to Financial Firms
- Rescue Operations
- Operations Focused on Broader Credit Conditions
- Other Assets
- Treasury Portfolio

Billions of Dollars

Source: Federal Reserve Board of Governors
Under current law, the federal budget is on an unsustainable path—meaning that federal debt will continue to grow much faster than the economy over the long run. Source: Congressional Budget Office June ‘09
Price of Legacy/Toxic Securities

ABX-06-02-AAA

ABX-06-02-BBB
What about Agriculture?
Vulnerabilities

Rural and Agricultural Financial Markets

- 148 Commercial bank failures since June 2008
- Regional exposure to Commercial Development and Real Estate Loans
- Pork and dairy markets
- Exposure to interest rate changes
- Additional deposit insurance fees for banks
Current Economic Drivers

Farmland Prices

- Net returns to land
  - Level
  - Volatility
- Energy prices
- Interest / inflation rates
- Housing crisis
- Scope & economic situation of buyers
- Demand for recreational land
- Capital gains tax rates
"...quarterly decrease of 6% (...in 2009) ... the largest quarterly decline since 1985" (Chicago Fed AgLetter).

"It's Confirmed: Farmland Prices are Correcting". Continuing with an attribution to USDA, "...both Bloomberg and the WSJ are reporting the first annual drop in U.S. farmland prices in 20 years of an average of -3.2%". (www.seekingalpha.com)

Various sources have cited declines in Iowa farmland values from last year ranging from about 5% to nearly 7.6% (HPJ Land Journal, ISU Ag Decision Maker, others).

In its mid-2009 survey, the Illinois Society of Professional Farm Managers and Rural Appraisers found high quality land to be down 2.38%, lower quality land off 5.6%, and were among the first to note evidence of expectations of declining cash rents.

USDA sources show farmland values in Illinois down .4% from the same period in 2008, with steeper declines in IN and IA, though surveyed cash rents paid were still up into 2009 from a year earlier.
### Is the sky falling?

<table>
<thead>
<tr>
<th>Year</th>
<th>Dow Index</th>
<th>Case-Shiller House Price Index/year</th>
<th>Chicago House Price Index</th>
<th>Illinois Farmland Total return</th>
</tr>
</thead>
<tbody>
<tr>
<td>1999-2008</td>
<td>1.10%</td>
<td>5.89%</td>
<td>3.00%</td>
<td>12.70%</td>
</tr>
<tr>
<td>2007</td>
<td>6.20%</td>
<td>-10.30%</td>
<td>-4.70%</td>
<td>16.20%</td>
</tr>
<tr>
<td>2008</td>
<td>-45.50%</td>
<td>-21.40%</td>
<td>-15.40%</td>
<td>18.90%</td>
</tr>
<tr>
<td>2009 to date</td>
<td>11.98%</td>
<td>0.41%</td>
<td>1.01%</td>
<td>-0.50%</td>
</tr>
</tbody>
</table>
## Estimated Returns to Land

<table>
<thead>
<tr>
<th>Region</th>
<th>Returns/Acre</th>
<th>Imputed Land Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Northern Illinois</td>
<td>265</td>
<td>5,893</td>
</tr>
<tr>
<td>Central Illinois High Productivity</td>
<td>263</td>
<td>5,849</td>
</tr>
<tr>
<td>Central Illinois Low Productivity</td>
<td>226</td>
<td>5,018</td>
</tr>
<tr>
<td>Southern Illinois</td>
<td>154</td>
<td>3,427</td>
</tr>
</tbody>
</table>

**Assumptions:**

- Schnitkey budgets + $50 return to land
- $4.00 / bu. Corn : $10.00 / bu. Soybeans
- 4.5% Capitalization Rate
What have we learned from the Crisis?

- Consumer has felt some pain
- Real estate prices can fall.
- Low documentation loans often don’t work.
- Credit spreads can widen quickly.
- In crisis, diversification does not work well.
- Pain can be severe.
- Lack of regulatory “sympathy” to smaller institutions.
- Total agricultural debt low relative to others.