Facets of the Bioeconomy Affecting the Small Towns of Iowa

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Presented at Community Futures: The Small Town in the Bioeconomy April 10, 2007
Projected U.S. Ethanol Production from Corn

 million gallons

2006 2007 2008 2009 2010 2016
Projected U.S. Ethanol Production from Corn

- 2006: 4,000 million gallons
- 2007: 6,000 million gallons
- 2008: 10,000 million gallons
- 2009: 14,000 million gallons
- 2010: 14,000 million gallons
- 2016: 16,000 million gallons
Projected Corn Prices

$/bu

2006 2007 2008 2009 2010 2016
Projected Soybean Planted Acreage

2006 2007 2008 2009 2010 2016

million acres

2006
2007
2008
2009
2010
2016
## Projected Soybean Prices

<table>
<thead>
<tr>
<th>Year</th>
<th>Price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>5.40</td>
</tr>
<tr>
<td>2007</td>
<td>6.80</td>
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<tr>
<td>2008</td>
<td>7.20</td>
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<tr>
<td>2009</td>
<td>7.40</td>
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<tr>
<td>2010</td>
<td>7.20</td>
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<td>2016</td>
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Community Impacts

- Farm operators
- Land owners
- Ethanol investors
- Infrastructure
- Environment
- Livestock industry
- Economic activity
Land Rent Determination

• Rent = Maximum willingness to pay for an additional crop ground
  – Higher crop prices have increased market returns over costs by about $155 per acre
  – Government payments reduced by about $35 per acre
➢ Land rents should jump by about $120 per acre
Agricultural Land Price Determination

- Change in land price =
  change in land rent * capitalization factor

  $120 * 16.67 = $2,000

- $3,000/ac pre-boom (2005) land prices

- 67% increase in value of Iowa cropland
Total Value of Iowa Cropland

Pre-Boom
Post-Boom

$ billion

0
20
40
60
80
100
120
140
Impact on Farm Operator Returns

• Money in
  – Crop revenue plus government payments

• Money out
  – Production costs, machinery payments, land rent

• If changes in land rent fully reflect changes in revenue and costs, then farm operators are unaffected
Impact on Land Owners

- Increased asset values increases wealth levels of many Iowans

- A significant portion of this increased wealth accrues to Iowa farmers and other rural residents

- Increased wealth is associated with increased investment and consumption.
Impact on Ethanol Plant Owners

• Economics of commodities
  – High prices lead to high profits
  – High profits leads to expansion of supply
  – Expansion of supply leads to lower prices
  – Lower prices reduce profits
  – Contraction of supply increases prices .....
Difference with Biofuels

- Economics of ethanol
  - High prices lead to high profits
  - High profits lead to expansion of supply
  - Expansion of supply lead to higher feedstock (corn) prices
  - Higher costs reduce profits, until...
  - No more incentive to invest in more ethanol plants
Projected U.S. Dry Mill Margins Over Operating Costs and Over Total Costs

$/bushel

Dry Mill Margin Over Operating Costs
Margin Over Total Cost
Infrastructure
Acres Planted to Corn and Soybeans in Iowa since 1995

Million

Corn

Soybeans

Infrastructure

• Greater investment in
  – storage
  – tillage equipment
  – fertilizer import, handling, manufacture
  – biorefineries (at least until 2009)
  – in-state grain transportation

• Less investment in
  – grain export facilities
Environmental Impacts

• Less CRP land
Percentage of Iowa CRP Acres to be Cropped at Different Corn Prices, from a Total of 1.9 Million Acres

$/bu

% Acres out of CRP

0% 10% 20% 30% 40% 50% 60% 70% 80%
Environmental Impacts

• Less CRP land
  – increased soil loss
  – increased nutrient runoff
  – loss of wildlife habitat

• Less conservation tillage as corn on corn acreage increases
Livestock Industry

- Higher feed costs reduce livestock feeder profits
- Lower profits leads to supply contraction
- Supply contraction leads to higher poultry, egg, hog, milk, and cattle prices

Does this mean hard times for a large Iowa industry?
Impact of the Move from Cheap to Expensive Corn on Beef

• Nebraska steer prices increase by 8.8%

• Retail beef prices increase by 4%

• Beef exports fall by 8%

• Beef Production falls by 1.6%
Impact of the Move from Cheap to Expensive Corn on Pork

- Hog cost of production increases 18%
- Pork production falls 4.6%
- Retail price of pork rises 4.2%
- Exports fall by 17% from baseline levels
Impact of the Move from Cheap to Expensive Corn on Broilers

- Wholesale broiler prices increase by 15%
- Retail prices go up by 5%
- Exports fall by 16%
- Domestic consumption falls by 4%
- Production falls by 6%
Health of the Livestock Industry

• Livestock will be marginally smaller

• Iowa impacted more by regulatory environment than by economic environment

• Future health could be enhanced by co-locating dairies and beef cattle operations with ethanol plants
Economic Activity

• On the positive side
  – New investments in physical plant and processing capacity
  – High crop prices and expanded crop production
  – More value added

• On the negative side
  – Marginally smaller livestock industry
  – Some negative feedback from environment?