Current Agricultural Conditions and Their Effects on Land Prices

The views expressed are those of the author and do not necessarily reflect the opinions of the Federal Reserve Bank of Kansas City or the Federal Reserve System.
Today’s Roadmap

- Financial and credit conditions
- Agricultural supply and demand conditions
- Commodity prices and agricultural profits
- Interest rate risk and farmland values
Recently, financial stress has moved closer to its long-run average.
Delinquency rates on commercial real estate and agricultural loans have eased.

Source: Federal Reserve Board of Governors
Bank profit margins have rebounded, and capital levels have risen.

**Return on Assets**

- **All Commercial Banks**
  - 2005: 0.9%
  - 2006: 0.9%
  - 2007: 0.9%
  - 2008: 0.3%
  - 2009: 0.3%
  - 2010: 0.0%

- **Agricultural Banks**
  - 2005: 0.9%
  - 2006: 0.9%
  - 2007: 0.9%
  - 2008: 0.3%
  - 2009: 0.3%
  - 2010: 0.0%

**Tier 1 Capital Ratio**

- **All Commercial Banks**
  - 2005: 10.0%
  - 2006: 10.0%
  - 2007: 10.0%
  - 2008: 8.0%
  - 2009: 8.0%
  - 2010: 8.0%

- **Agricultural Banks**
  - 2005: 10.0%
  - 2006: 10.0%
  - 2007: 10.0%
  - 2008: 8.0%
  - 2009: 8.0%
  - 2010: 8.0%

Source: FDIC and Agricultural Finance Data Book
Today’s Roadmap

- Financial and credit conditions
- Agricultural supply and demand conditions
World grain and cotton supplies shrink with weather concerns.

Global Crop Inventories

Ending stocks as a percent of annual use (2000=100)

- Cotton
- Corn
- Rice
- Wheat

Source: USDA
U.S. crop inventories have fallen.

U.S. Crop Inventories

Ending stocks as a percent of total annual use

- Corn
- Wheat
- Soybeans

Source: USDA
F denotes February 2011 forecast
Agricultural exports have surged led by exports to Asia.

Real U.S. Agricultural Exports

- World Total (Left Scale)
- Asia (Right Scale)

Source: USDA
U.S. food expenditures have rebounded.
Ethanol production has surged.

U.S. Ethanol Production

Million barrels

Source: Energy Information Administration
Today’s Roadmap

- Financial and credit conditions
- Agricultural supply and demand conditions
- Commodity prices and agricultural profits
Crop prices have risen significantly, but so has volatility.

U.S. Crop Prices

Dollars per bushel

Source: Commodity Research Bureau
Livestock prices are keeping pace with rising feed costs, especially in cattle.

Source: USDA, Iowa State University, and California Department of Food and Agriculture
Net farm income is expected to rise in 2011.

U.S. Real Net Farm Income

Constant 2005 dollars (billions)

Source: USDA
Note: Forecast is denoted with an ‘F’

10 year average ($69 billion)
Today’s Roadmap

- Financial and credit conditions
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- Interest rate risk and farmland values
Farmland values have surged.

Non-irrigated Cropland Values
(Percent change from 2009:Q4 to 2010:Q4)

- Montana: 13.6%
- North Dakota: 23.7%
- Minnesota: 19.3%
- Northern Wisconsin: 10.7%
- Wyoming: 6.6%
- Colorado: 9.8%
- Nebraska: 17.6%
- Iowa: 18.0%
- Illinois: 11.0%
- Indiana: 12.0%
- Texas: 4.9%
- Kansas: 19.3%
- Western Third of Missouri: 6.6%
- Oklahoma: 5.0%
- Southern Wisconsin: 7.0%
- North Dakota: 4.0%

Source: Federal Reserve District Surveys
(Chicago, Minneapolis, Kansas City, Dallas)
The targeted fed funds rate remains at the zero bound.

Source: Federal Reserve Board of Governors
Over time, the real fed funds rate and net farm income tend to move in opposite directions.

Sources: USDA, Federal Reserve, BLS
## Capitalized Revenues from Corn Production

Land values should equal capitalized revenues

\[
\text{Land Values} = \frac{\text{Expected Revenues}}{\text{Capitalization Rate}}
\]

Assumptions:
- Corn Price: $5.00 per bushel
- 25% of gross revenues go to land

<table>
<thead>
<tr>
<th>Yield (bushel per acre)</th>
<th>150 bushels</th>
<th>200 bushels</th>
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<tbody>
<tr>
<td>Capitalization rate</td>
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<tr>
<td>5%</td>
<td>3750</td>
<td>5000</td>
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</tbody>
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Note: Nebraska irrigated corn yield 198 bushels per acre (2009 average)
U.S. average annual price $5.20 per bushel (2010 average)
At $5 per bushel corn, rising cap rates could slash cropland values.

Authors’ calculations assuming 200 bushels per acre and 25% of gross revenues capitalized into land.

Dollars per acre

Farmland capitalization rate

Eastern Nebraska Irrigated Cropland Value = $5,000
At a historical cap rate of 7.5 percent, record high corn prices are needed to justify current cropland values.

Authors’ calculations assuming 200 bushels per acre and 25% of gross revenues capitalized into land.
Questions?

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www.kansascityfed.org/omaha