Outlook on Farmland Values, the Ag Economy, and Ag Credit Availability

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.
A Booming Farm Economy
U.S. food expenditures have rebounded.

Source: Census Bureau
Exports, primarily to China, surge to record highs.

Source: USDA
World crop inventories have fallen to near record lows.

Source: USDA
Rising feed costs strain profit margins.

U.S. Livestock Prices and Breakeven Costs

Dollars per hundredweight

Source: USDA and Iowa State University
Stronger farm incomes boost agricultural equipment sales.

Source: Association of Equipment Manufacturers and USDA
Cropland values surge across the Corn Belt.

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

Source: Federal Reserve District Surveys
(Chicago, Minneapolis, Kansas City, Dallas)
Land values are rising faster than cash rents, pushing farmland multiples to record highs.

Farmland Values to Rent Ratio

- **Iowa Farmland**
- **Indiana Farmland**
- **East NE Irrigated Cropland**

Calculations based on Iowa State University, University of Nebraska, and Purdue University data.
In other words, returns to farmland have fallen to record lows.

Rent-to-Value Ratio or Rate of Return on Farmland

Calculations based on Iowa State University, University of Nebraska, and Purdue University data.
Net Present Value Theory

Land values should equal capitalized revenues

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

1) Stronger revenues lead to higher land values
2) Lower discount or capitalization rate lead to higher land values

How do interest rates affect revenues and capitalization rates?
Interest Rates and Capitalization Rates

Interest rates determine the current value of future incomes.

How much is $100 in 2012 worth today?
Answer: How much money do you need to save today to receive $100 in 2012?

<table>
<thead>
<tr>
<th>2011 Value</th>
<th>Interest Rate</th>
<th>2012 = $100</th>
</tr>
</thead>
<tbody>
<tr>
<td>$95</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>$99</td>
<td>1%</td>
<td></td>
</tr>
</tbody>
</table>
## Capitalized Revenues from Corn Production

**Assumptions:**
- Corn Price: $5.35 per bushel
- 25% of gross revenues go to land

<table>
<thead>
<tr>
<th>Capitalization rate</th>
<th>Yield (bushel per acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>170 bushels</td>
</tr>
<tr>
<td>5%</td>
<td>4548</td>
</tr>
<tr>
<td>4%</td>
<td>5684</td>
</tr>
<tr>
<td>3%</td>
<td>7579</td>
</tr>
</tbody>
</table>

Nebraska’s average yield was 164 from 2006 to 2010
U.S. average annual price $5.35 per bushel in 2010
Current land values assume historically high prices and historically low interest rates.

Capitalized Land Revenues from Corn Production

Dollars per acre

- 3%
- 4%
- 5%

Eastern Nebraska Irrigated Cropland
Estimated Average Value
($5300 per acre*)

Dollars per bushel

Based on 210 bushel yield
*Calculations based on UNL and FRBKC data
Agriculture Faces Huge Interest Rate Risk
What happens if capitalization rates and interest rates rise?

Capitalized Revenues from Corn Production

Dollars per acre

Dollars per bushel

- Capitalized Value at 7% capitalization rate and 200 bushel yield
- Estimated Eastern Nebraska Irrigated Cropland Value

- 57% decrease
- 43% decrease
- 29% decrease
How do interest rates affect farm incomes?

Falling interest rates ...
- Weakens the dollar,
- Lifts exports,
- Raises commodity prices,
- Boosts farm incomes

Rising interest rates ...
- Strengthens the dollar,
- Shrinks exports,
- Lowers commodity prices,
- Cuts farm incomes

Sources: USDA, Federal Reserve, BLS
Have the Risks Changed for the Macro Economy?
What is the Risk?

**Economic Malaise**
And
**Deflation**

**Robust Job Growth**
And
**Inflation**
Inflation is based on money and velocity.

**Quantity Theory of Money**

\[
\text{Price} = \frac{\text{Money} \times \text{Velocity}}{\text{Quantity}}
\]

**Definition of Inflation:**

Too much money \( M \uparrow \)

chasing \( V \uparrow \)

too few goods \( Q \downarrow \)
What Shapes Velocity?

- Spending
- Lending
- Investment
After a summer lull, consumer spending is on the rise.

U.S. Monthly Retail and Food Sales

Source: U.S. Census Bureau
The summer export drag was caused by spending and rising imports.

U.S. Exports and Imports

Source: Bureau of Economic Analysis
With rising loan demand and easing credit standards, lending should rise.

Loan Demand at Commercial Banks

Net percent of bankers reporting stronger loan demand

- Commercial Real Estate
- C&I Loans - Large Firms
- Consumer Loans

Source: Federal Reserve Board of Governors
Business investment is beginning to rebound.

Nonresidential Fixed Investment

Percent change from year ago

Source: Bureau of Economic Analysis
Quantitative easing (QE) has expanded the Federal Reserve balance sheet.

![Federal Reserve Balance Sheet: Assets](chart)

- Fed Agency Debt MBS Purchases
- Liquidity to Key Credit Markets
- Lending to Financial Institutions
- Long Term Treasury Purchases
- Traditional Security Holdings

Source: Federal Reserve Bank of Cleveland
Monetary base is being held in excess reserves.

Excess Reserves Held by Depository Institutions

Dollars

0
200,000
400,000
600,000
800,000
1,000,000
1,200,000
1,400,000

Jan-00 Jan-02 Jan-04 Jan-06 Jan-08 Jan-10

Commercial Banks

Lend Money into the Economy

Hold Money in Excess Reserves at the Federal Reserve

Source: Federal Reserve
Agricultural Financing
Farm real estate debt continues to rise, with a plateau in non-real-estate debt.

Farm Debt Outstanding at Commercial Banks

- Real Estate Loans
- Non-real-estate Loans

Source: Agricultural Finance Databook, Federal Reserve Bank of Kansas City
Interest rates remain near historical lows.

Average Effective Interest Rate on Non-Real-Estate Farm Loans

Source: Agricultural Finance Databook, Federal Reserve Bank of Kansas City
Farm loan delinquencies have risen above historical averages, especially for real estate.

Delinquent Farm Loans Held by Insured Commercial Banks

- Nonperforming Real Estate Loans
- Nonperforming Non-real-estate Loans

Source: Agricultural Finance Databook, Federal Reserve Bank of Kansas City
Conclusions

- Farm incomes are booming and farmers are buying tractors, land, and more.
- Farm real estate markets face major interest rate risk.
- Monetary policy is risk management.
- Inflation depends on velocity: spending, lending, and investment.
- Commercial banks are lending to agriculture, even with rising delinquency rates.

*Managing debt wisely and keeping leverage low is the best way to manage volatility.*
For More Information on Agricultural and Rural Economies

www.kansascityfed.org