Agricultural Investments and Finance

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.
Crop producers use booming incomes to pay off debts and boost capital spending.
Big cash flows cut loan demand and spur competition for loans.
Farmland values surge as rising incomes are capitalized.
Is this a “New Golden Era” or fool’s gold?
It depends on leverage.
Farm incomes quickly translate into capital spending.

Farm Income, Debt Repayment and Farm Capital Spending
(Tenth Federal Reserve District)

Source: Federal Reserve Bank of Kansas City
Rising farm incomes boost rural spending and manufacturing.

**Rural manufacturing employment**
- Up 3.8% in 2011
- Up 14% since 2009

**U.S. Tractor and Combine Sales**

<table>
<thead>
<tr>
<th>Year</th>
<th>4 Wheel Drive Tractor Sales</th>
<th>Combine Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2002</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2004</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>2006</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>2008</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>2010</td>
<td>9</td>
<td>6</td>
</tr>
</tbody>
</table>

Source: Association of Equipment Manufacturers
Banks had plenty of funds available for loans, but faced weak loan demand.

Farm Operating Loan Demand and Funds Availability
Tenth Federal Reserve District

Diffusion Index

Farm Operating Loan Demand and Funds Availability

Is this a signal for future loan demand?

Source: Federal Reserve Bank of Kansas City
Large banks are offering lower rates on non-real estate loans.

Average Effective Interest Rates on Agricultural Loans

Source: Agricultural Finance Databook
While falling, delinquency rates are higher at larger commercial banks.

### Delinquency Rates on Agricultural Loans

**Real Estate Farm Loans**
- Percent of ag loans (100 Largest Lenders)
- Percent of ag loans (All Other Lenders)

**Non-Real Estate Farm Loans**
- Percent of ag loans (100 Largest Lenders)
- Percent of ag loans (All Other Lenders)

Source: Federal Reserve Board of Governors
Is there a farmland bubble?
Farmland values are booming.

Non-irrigated Cropland Values
Fourth Quarter 2011
Percent change from prior year

Source: Agricultural Finance Databook,
Federal Reserve Bank of Kansas City
Strong gains across all types of land.

Tenth District Farmland Value Gains

Percent change from the previous year *

*Percent changes are calculated using responses only from those banks reporting in both the past and the current quarter.
Source: Federal Reserve Bank of Kansas City
Land values are rising faster than cash rents, pushing farmland multiples to record highs.

Farmland Values to Rent Ratio

Calculations based on Iowa State University, University of Nebraska, and Purdue University data
The Foundation of Farmland Boom/Bust Cycles
Is agriculture set up for another correction?

**Iowa Corn Prices and Farm Real Estate Values**

- Dollars per acre (Constant 2011 dollars)
- Corn Price - 5 year average (Right Scale)

<table>
<thead>
<tr>
<th>Year</th>
<th>Corn Price (Dollars per bushel)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>0.5</td>
</tr>
<tr>
<td>1900</td>
<td>1.0</td>
</tr>
<tr>
<td>1920</td>
<td>1.5</td>
</tr>
<tr>
<td>1940</td>
<td>2.0</td>
</tr>
<tr>
<td>1960</td>
<td>3.0</td>
</tr>
<tr>
<td>1980</td>
<td>4.0</td>
</tr>
<tr>
<td>2000</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Federal Reserve Bank of Kansas City – Omaha Branch
Regional, Public, Community Affairs Division

www.kansascityfed.org/omaha
Elevated export trends similar to the 1950s could keep farm prices high.

U.S. Agricultural Exports and Farm Prices

Billion dollars (2005 constant dollars)

Calculations based on U.S. Census Bureau and U.S. Department of Agriculture data deflated with consumer price index from the Federal Reserve Bank of Minneapolis and USDA inflation expectations.
Real interest rates were negative or zero during 1910s, 1940s, 1970s, and today.

Real Yield on 10-year Treasury Security

Calculations based on U.S. Department of Treasury data deflated with consumer price index from the Federal Reserve Bank of Minneapolis.
What made the 1940s different? The lack of leverage.

U.S. Farm Debt

Billion dollars (2005 constant dollars)

Calculations based on U.S. Census Bureau and U.S. Department of Agriculture data deflated with consumer price index from the Federal Reserve Bank of Minneapolis.
How much debt is in the system?

Farm Real Estate Debt

Percent change from previous year

<table>
<thead>
<tr>
<th>USDA</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.8</td>
<td>-3.0</td>
</tr>
</tbody>
</table>

| Commercial Banks | 2.0 | 0.6 |
| Farm Credit System | 2.4 | 4.7 |

Source: USDA, Federal Reserve Bank of Kansas City, Federal Farm Credit Banks Funding Corporation
Debt is being used to finance land purchases.

Financing Farmland Purchases in the Tenth District

Percent of total financing

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Down Payment</th>
<th>Pledged Existing Equity</th>
<th>New Debt Financed</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011 First Quarter</td>
<td>19.8%</td>
<td>29.1%</td>
<td>51.1%</td>
</tr>
<tr>
<td>2011 Third Quarter</td>
<td>21.2%</td>
<td>31.6%</td>
<td>47.2%</td>
</tr>
</tbody>
</table>

Source: Federal Reserve Bank of Kansas City
Agriculture faces significant interest rate risk.

- Higher interest rates ...
  - boost debt service costs,
  - can trigger lower farm incomes if the value of the dollar rises and exports fall, and
  - raise capitalization rates, which lowers farmland values.
What happens to farmland values if prices decline?

Net Present Value = 30% of Expected Gross Revenue

Expected Capitalization Rate

<table>
<thead>
<tr>
<th>Capitalization Rate (percent)</th>
<th>Corn Price (dollars per bushel)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$3.00</td>
</tr>
<tr>
<td>3%</td>
<td>6,000</td>
</tr>
<tr>
<td>4%</td>
<td>4,500</td>
</tr>
<tr>
<td>5%</td>
<td>3,600</td>
</tr>
<tr>
<td>6%</td>
<td>3,000</td>
</tr>
<tr>
<td>7%</td>
<td>2,571</td>
</tr>
<tr>
<td>8%</td>
<td>2,250</td>
</tr>
</tbody>
</table>

Assumption corn yields 200 bushels per acre
Conclusions

- Booming farm incomes allowed farmers to pay off debts and boost capital spending.
- Competition for loans intensifies amid weak loan demand and liquidity.
- Surging farm land values raise concerns about interest rate risk.
- How farmers respond to tighter margins will determine if leverage turns today’s “New Golden Era” into fool’s gold?
To Receive an Invitation to the Federal Reserve Bank of Kansas City’s 2012 Agricultural Symposium
July 16-17, 2012
Please email AgSymposium@kc.frb.org