Will Farmland Values Spur a Wealth Effect in U.S. Agriculture?

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.
Farmland values have surged dramatically.

Cropland Values by State

- Nebraska (non-irrigated)
- Nebraska (irrigated)
- Colorado (irrigated)
- Kansas (non-irrigated)

Source: USDA
The farmland value surge continued in 2012.

Federal Reserve 10th District Farmland Value Gains

Percent change from a year ago

Source: FRB KC, Survey of Agricultural Credit Conditions
Farmland value gains were strongest in the Plains.

Non-irrigated Cropland Values
Fourth Quarter 2012

Percent change from previous year

- Montana 5.4%
- North Dakota 37.4%
- Minnesota 27.1%
- South Dakota 33.6%
- Nebraska 26.8%
- Iowa 20.0%
- Western Missouri 24.2%
- Kansas 29.2%
- Oklahoma 9.3%
- Texas 3.4%
- Northern Louisiana 11.6%
- Northern Illinois 18.0%
- Northern Indiana 10.0%
- Southern Wisconsin 11.0%
- Northern New Mexico 20.6%
- Colorado

Source: Agricultural Finance Databook, Federal Reserve Bank of Kansas City
Is it a bubble?
Land values have followed corn prices higher.

Source: USDA and Commodity Research Bureau
Farm incomes have been soaring.

U.S. Real Net Farm Income

Billion Dollars (Constant 2012 Dollars)

Source: USDA
Cash rents have advanced more slowly.

10th District Farmland Values and Cash Rental Rates - Annual Gains

Nonirrigated Cropland

Irrigated Cropland

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
What is the implied P/E ratio?

Land Values and Corn Prices at Various Capitalization Rates

* Assumptions: Corn yields 160 bu/acre and land accounts for 30% of total production costs.
How do landowners connect land prices with corn prices?

Current Farmland Values and Corn Price Expectations, Spring 2012

Source: Gloy, B. “When Do Farm Booms Become Bubbles?” 2012 Agricultural Symposium, Federal Reserve Bank of Kansas City.
What is the risk of a bust if it is a bubble?
Historically, farm bankruptcies spike with the debt-to-asset ratio.

Source: USDA and Stam and Dixon, 2004
Note: Farm bankruptcy data was not available for the following years, 1982-1986 and 2003-2011.
### U.S. Farm Sector Debt-to-Asset Ratio Under Alternative Debt and Asset Scenarios

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<th>Rise in Debt (Percent change)</th>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
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<td>50</td>
<td>15.9</td>
<td>17.7</td>
<td>19.9</td>
<td>22.7</td>
<td>26.5</td>
<td>31.8</td>
</tr>
</tbody>
</table>
Farm leverage is historically low.

U.S. Farm Debt to Equity Ratios

Source: USDA
Delinquency rates remain low.

Delinquency Rates at Commercial Banks

Percent

Source: Federal Reserve Bank of St. Louis
Agricultural credit conditions at commercial banks have cycled.

Source: Agricultural Finance Databook

*Commercial bankers responded by indicating whether conditions during a given quarter were higher than, lower than, or the same as in the year-earlier period. The index numbers are computed by subtracting the percentage of bankers who responded “lower” from the percentage who responded “higher” and adding 100.
Agriculture is booming… But there are still risks.
Farm incomes are projected to drop sharply.

U.S. Real Net Farm Income

Billion Dollars (Constant 2012 Dollars)

Source: USDA
Crop prices are retreating.

U.S. Crop Prices

Dollars per bushel

- Corn
- Soybeans
- Wheat

Source: Commodity Research Bureau and Chicago Mercantile Exchange
Livestock profits have not recovered.
What will happen to Renewable Energy Policy?

Source: Energy Information Administration.

* Ethanol Production is net of trade
Will agricultural export markets strengthen?

U.S. Agricultural Exports

Billion Dollars

China
All Other Countries

(9.5%)*

(18.4%)*

Source: USDA
Note: 2013 agricultural exports forecast based on year-to-date 2013 annual growth rate.
* China’s share of total U.S. agricultural exports in parentheses.
Is the commodity boom over?

Performance of Commodities vs. Equities

Commodities
- Natural Gas
- Gasoline
- Crude Oil
- Copper
- Gold
- Platinum
- Corn
- Wheat
- Live Cattle
- Cocoa
- Coffee
- Sugar

Equities
- S&P 500 Index

Source: Calculations based on data obtained from Commodity Research Bureau (through April 12, 2013)
How will investments respond to income changes?

U.S. Farm Profits and Capital Investments per Farm

Net Returns to Farm Operators (Left Scale)

Farm Capital Expenditures (Right Scale)

Source: USDA
Farmers are buying new toys.

U.S. Tractor and Combine Sales

Thousand units per month

Source: Association of Equipment Manufacturers
Farm debt started to rise in 2012.

Farm Debt Outstanding at Commercial Banks

- Non-Real Estate
- Real Estate

Percent change from previous year

Source: FDIC, Call Report data
More debt was used to finance land purchases.

Financing Farmland Purchases in the Tenth District

Percent of total financing

<table>
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<tr>
<th></th>
<th>2012 First Quarter</th>
<th>2012 Fourth Quarter</th>
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<tbody>
<tr>
<td>Cash Down Payment</td>
<td>22.1</td>
<td>22.5</td>
</tr>
<tr>
<td>Pledged Existing Equity</td>
<td>30.4</td>
<td>27.4</td>
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<tr>
<td>New Debt Financed</td>
<td>47.5</td>
<td>50.1</td>
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</table>

Source: Federal Reserve Bank of Kansas City
Farm debt appears to be concentrated.

- KS Farm Management Farms:
  - Average Debt-to-Asset Ratio
    - 1979 – 24.6%
    - 2010 – 26.8%
  - Debt-to-Asset Ratio >40%
    - 1979 – 19.4%
    - 2010 – 25.6%
  - Debt-to-Asset Ratio >70%
    - 1979 – 1.3%
    - 2010 – 5.9%

Interest rates are expected to rise… Farmland values? U.S. dollar?

Target Federal Funds Rate at Year-End

Source: Federal Reserve Board of Governors, Summary of Economic Projections
Conclusions

- U.S. agriculture and land values are booming.
- Risks in agriculture present risks for 10th District banks.
  - Farmland values
  - Farm incomes
  - Renewable energy policy
  - Export markets
  - Farm debt
  - Interest rates
Federal Reserve Bank of Kansas City
2013 Agricultural Symposium

For an invitation e-mail
AgSymposium@kc.frb.org