U.S. Agricultural Outlook

IBA/ISU Agricultural Credit School
Ames, Iowa

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

- Background on the Federal Reserve
- Recent boom in U.S. agriculture
- Outlook for farm sector in 2013
- Outlook beyond 2014
- Are there risks of a bust?
Missions of the Federal Reserve

- Founded in 1913 with 3 core missions:
  - Promote an efficient payments system
  - Safeguard the competitiveness, safety, and soundness of the banking system
  - Conduct monetary policy
Structure of the Fed

- Board of Governors
- 12 Regional Reserve Banks (24 Branches)
- Federal Open Market Committee (FOMC)
Why does the Fed care about agriculture?

- Conducting Monetary Policy
  - FOMC Regional Outlook
  - Beige Book
- Bank Supervision and Regulation
Why does the Kansas City Fed follow agriculture?

Net Farm Income per Capita
Thousand Dollars

10th District
• 18% of U.S. farm income
• 19% of corn production
• 31% of wheat production
• 21% of cattle inventories
U.S. agriculture has been booming.
Farm incomes have been soaring.

U.S. Real Net Farm Income

Billion Dollars (Constant 2012 Dollars)

Source: USDA
Strong crop prices have boosted farm incomes.

U.S. Crop Prices

Source: Commodity Research Bureau and Chicago Mercantile Exchange
Agricultural exports have surged, especially to China.

U.S. Agricultural Exports

Billion Dollars

- China
- All Other Countries

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.
U.S. ethanol production has also lifted crop prices.

Source: Renewable Fuels Association
Farmland values have followed corn prices higher.

Iowa Farmland Values and Corn Prices

Source: USDA and Commodity Research Bureau
Recent farmland value gains have been strongest in the Plains.

Non-irrigated Cropland Values
Fourth Quarter 2012

Source: Agricultural Finance Databook, Federal Reserve Bank of Kansas City
Debt and loan delinquency rates have fallen.

U.S. Agricultural Delinquency Rates and Farm Debt

Source: Federal Reserve Bank of St. Louis and USDA
Crop insurance has provided some support.

Crop Insurance for Iowa Corn Acreage: 2012

Percent of Planted Acres

- Revenue Protection
- All Other Plans

Total IA Corn Acreage Insured in 2012

Source: USDA Risk Management Agency
Livestock profits have not yet recovered.
What does 2013 hold for the farm sector?
Drought conditions have eased.
Corn stocks are projected to rebound.

U.S. Corn Inventories

Ending stocks-to-use ratio

- Inventories (Left Scale)
- Price (Right Scale)

Dollars per bushel

Source: USDA
Crop prices are expected to fall post-harvest, again.

U.S. Corn Futures Prices

Sources: barchart.com, data as of May 29, 2012 and CBOT, data as of May 29, 2013
Potential harvest prices vary.

December Corn Futures Price Distribution
Based on Implied Volatility from Options Prices

- Probability of corn less than $4: 12%
- Probability of corn more than $7: 24%

Source: Author’s calculations based on data obtained from barchart.com on May 29, 2013.
Beyond 2013, there are risks.
Farm incomes are projected to drop sharply in 2014.

U.S. Real Net Farm Income

Billion Dollars (Constant 2012 Dollars)

Source: USDA
Crop sector profits are projected to fall in 2014.

Net Returns
(Returns less variable costs)

Source: USDA Agricultural Baseline Projections, various years
Profits are projected to rise for livestock.

Feed Price Ratios

Source: USDA Agricultural Baseline Projections
Will export demand continue to grow?

U.S. Agricultural Export Growth

Billion dollars

Exports
Imports

USDA Baseline Projections

Source: USDA
Global crop markets have become more competitive.

Global Corn, Soybean, and Wheat Expansion

Acreage Index (2000 = 100) Percent

- U.S. Share of World Acreage (Right Scale)
- U.S. (Left Scale)
- Brazil & Argentina (Left Scale)
- China (Left Scale)
- Black Sea Region* (Left Scale)

* Black Sea Region includes Russia, Ukraine, and Kazakhstan
Source: USDA
Will Ethanol hit the “Blend Wall”?  

**U.S. Motor Gasoline Use**  
Fell 2.7% in 2011  
2015 forecast down 3.6%  

U.S. Ethanol Standard is a 10% blend.  

**Projections of 2015 Ethanol Consumption**  
In 2007, 15 billion gallons  
Today, 13.1 billion gallons  

Current Ethanol Production Capacity  
13.7 billion gallons  

**Source: EIA**  

**U.S. Motor Gasoline Consumption**  

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2013 Forecast: 140 billion gallons  
2012 Forecast: 135 billion gallons  
2010 Forecast: 130 billion gallons
Interest rates are expected to rise.

Source: Federal Reserve Board of Governors, Summary of Economic Projections, March 2013
Are there risks of a bust?
Leverage cycles drive booms and busts.

U.S. Farm Debt

Billion dollars (2005 constant dollars)

- Non-real-estate Debt (Left Scale)
- Real Estate Debt (Left Scale)
- Net Returns to Farm Operators (Right Scale)

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 will investments and debt respond to income changes?

**U.S. Farm Profits and Capital Investments per Farm**

- Thousand Dollars (2005 Dollars)
- Thousand Dollars (2005 Dollars)

- **Net Returns to Farm Operators** (Left Scale)
- **Farm Capital Expenditures** (Right Scale)

Source: USDA
Farm debt started to rise in 2012.

Farm Debt Outstanding at Commercial Banks

Source: FDIC, Call Report data
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%

Is farmland overvalued?

Cropland Value-to-Cash Rent Ratios

Percent change from previous year

- Iowa Cropland
- Kansas Non-irrigated Cropland

Source: NASS, USDA and Iowa State University

Investors will spend $32 for every dollar of revenue. Implies a capitalization rate of 3.1%
Land values are based on expectations.

Capitalized Value Formula

\[
\frac{30\% \text{ of Expected Price} \times \text{Yield}}{\text{Expected Capitalization Rate}}
\]

According to USDA, land costs are projected to account for a quarter of total corn production costs and a third of soybean production costs in 2012 and 2013.

What are your expectations for crop prices and interest rates?
More debt was used to finance land purchases in 2012.

Financing Farmland Purchases in the Tenth Federal Reserve District

Source: Federal Reserve Bank of Kansas City
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.
### What is needed to trigger a farm bust?

#### U.S. Farm Sector Debt-to-Asset Ratio
**Under Alternative Debt and Asset Scenarios**

Decline in Farm Assets (Percent change)

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How could monetary policy affect U.S. agriculture?
What is the exit strategy?

Federal Reserve Balance Sheet: Assets

Billion Dollars

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

Source: Federal Reserve Board of Governors

Source: Federal Reserve Board of Governors
Conclusions

- U.S. agriculture and land values are booming.
- Beyond 2013, there are risks that could bring an end to the boom.
  - Interest Rates
  - Farmland values
  - Export markets
  - Farm incomes
  - Renewable energy policy
  - Farm debt
Federal Reserve Bank of Kansas City
2013 Agricultural Symposium

For an invitation e-mail
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