Near-term and Long-term Risks in the U.S. Corn Belt

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.
U.S. agriculture has been booming recently.
Farm income has been near record highs.

**U.S. Real Net Farm Income**

- **Net Farm Income (Left Scale)**
- **Corn Price (Right Scale)**

Source: USDA and CBOT
Farmland values have followed corn prices higher.

Iowa Farmland Values and Corn Prices

- **Iowa Farm Real Estate Value (Left Scale)**
- **Average Corn Price (Right Scale)**

Source: USDA and Commodity Research Bureau
Is the farm boom sustainable?
The recipe of a boom/bust cycle.

1. Profits strengthen (1910s, 1940s, 1970s, 2000s).
2. Capital investments accelerate.
3. Profits fade.
5. Elevated capital spending persists, supported by wealth, and financed with debt.
Near-term risks differ from long-term risks.
Recently, farm income has started to slip.

Tenth District Farm Income

Source: Federal Reserve Bank of Kansas City
* Bankers responded to each item by indicating whether conditions during the current 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.
A sharp drop in corn prices has weighed on crop sector incomes.

U.S. Corn and Soybean Prices

Source: Commodity Research Bureau and CBOT
As a producer, how might you perceive volatility?

A. Nuisance requiring risk management strategies.

B. A reflection of uncertainty about potential future fundamentals.
Uncertainty about future corn prices has diminished.

**Implied Volatility of U.S. Corn Options Contracts**

*5 Day Moving Average*

Source: barchart.com
Expectations about 2014 corn prices highlight a near-term risk.

Probability Distribution for U.S. Corn Prices in One Year

Sources: barchart.com and author’s calculations.
How quickly will input costs and/or cash rents adjust?

Corn Revenue and Costs

Dollars per planted acre

- Revenue (Left Scale)
- Seed & Fertilizer (Right Scale)
- Rental Rate (Right Scale)

Source: USDA
Overall, liquidity should help protect against near-term risk.

Current Ratios for U.S. Corn Producers by Age

Source: USDA
Note: Numbers in parentheses and width of bars depict the percentage of farmers in each age category.
Long-term, the risks are more complex.

1. Demand
   a) Domestic Livestock
   b) Ethanol
   c) Exports
2. Supply
   a) Global competition
3. Balance Sheet
   a) Debt
   b) Farmland Values
4. Monetary Policy (Interest Rates)
Ethanol’s share of corn consumption has been rising steadily.

Sources of U.S. Corn Consumption

- Share of U.S. Corn Consumed for Ethanol Production
- Share of U.S. Corn Consumed as Exports

Source: USDA.
Demand growth from ethanol production appears to have slowed.

**Annual U.S. Ethanol Production and RFS Mandates**

- **RFS1 Mandates**
- **RFS2 Mandates**
- **U.S. Ethanol Production**

Sources: Renewable Fuels Association and Environmental Protection Agency
Demand growth from meat production has come from pork and poultry.

U.S. Meat Production

Billion Pounds

100
80
60
40
20
0


Pork, Chicken & Turkey

COMPETING MEAT SUPPLIES

BEEF

51% Total production

28% Total production

Sources: Renewable Fuels Association and Environmental Protection Agency
How will investments and debt respond to income changes?

Farm Debt Outstanding at Commercial Banks

Percent change from previous year

Source: Agricultural Finance Databook, Table B.1
Is a farmland adjustment coming?

Cropland Value-to-Cash Rent Ratios

Percent change from previous year

Investors will spend $32 for every dollar of revenue. Implies a capitalization rate of 3.1%

Source: NASS, USDA, Iowa State University, and The Federal Reserve Bank of Kansas City
Farmland values have been surging, but show some signs of moderating.

Tenth District Farmland Value Gains

Percent change from the previous year

Source: Federal Reserve Bank of Kansas City
Interest rates are still expected to rise.

Appropriate Pace of Policy Firming
Target Federal Funds Rate at Year-End

Source: Federal Reserve Board, Summary of Economic Projections, December 2013
The Fed continues QE at a slightly reduced pace.

Federal Reserve Balance Sheet: Assets

Source: Federal Reserve Board of Governors
Risks to monitor over the next year.

1. Farm Bill
   - Direct payments expected to be eliminated.
   - Focus on crop insurance, but does not protect against multi-year risk.

2. Working capital.
   - Will it erode? How quickly?

3. Farmland
   - Volume of transactions, lease arrangements.

4. Global competition
   - Weather in South America has been favorable.
   - Ukraine 2013 corn production up 40% from 2012.
Risks to monitor over the next year.

5. Ethanol
   - Response to EPA markdown.

6. Monetary Policy
   - Will long-term rates rise?

7. Trade
   - Growth in EU, China?

8. Demand for livestock products

9. Adverse weather regionally
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