Agricultural Risks
What are Agriculture’s Risks?
The Goal: Foster Maximum Employment and Stable Prices

Economic Projections of Federal Open Market Committee Members, Central Tendency, April 2011

<table>
<thead>
<tr>
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<th>Longer Run</th>
<th>2011</th>
<th>2012</th>
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<tbody>
<tr>
<td>Real GDP Growth</td>
<td>2.5 to 2.8</td>
<td>3.1 to 3.3</td>
<td>3.5 to 4.2</td>
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<td></td>
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<td>3.4 to 3.9</td>
<td>3.5 to 4.4</td>
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<td>Unemployment Rate</td>
<td>5.2 to 5.6</td>
<td>8.4 to 8.7</td>
<td>7.6 to 7.9</td>
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<td></td>
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<td>8.8 to 9.0</td>
<td>7.6 to 8.1</td>
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<td>PCE Inflation</td>
<td>1.7 to 2.0</td>
<td>2.1 to 2.8</td>
<td>1.2 to 2.0</td>
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<td></td>
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<td>1.3 to 1.7</td>
<td>1.0 to 1.9</td>
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Source: Federal Reserve Board of Governors
Consumer spending rises further.

U.S. Monthly Retail and Food Sales

Billion dollars

Source: U.S. Census Bureau
Will stronger home sales be enough to lift residential building activity?

Single-family Housing Activity

Index (2005=100)

Source: Census Bureau
Business investment strengthens for equipment and software.

U.S. Non-residential Investment

Percent change from year ago

Source: Census Bureau
U.S. exports have strengthened and the dollar has weakened.

Source: Bureau of Economic Analysis and Federal Reserve
Will the federal government be able to control U.S. debt accumulation?

Federal Government Debt as a Percent of GDP

CBO Assumptions (2012 to 2021):
GDP Growth: 4.7%
Debt growth: 5.8%

Source: Federal Reserve Board of Governors and Congressional Budget Office
Have Inflation Risks Changed?
The Federal Reserve has expanded the monetary base.

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 Bank of Cleveland
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 too few goods \( Q \downarrow \)

\( V \uparrow \)
Consumers prices are rising, especially for food and energy.

Source: Bureau of Economic Analysis
When will excess reserves begin to decline?

Commercial Banks can either hold money in excess reserves at the Federal Reserve or lend money into the economy.

Excess Reserves of Depository Institutions

![Graph showing the increase in excess reserves from January 2008 to January 2011]

Source: Federal Reserve Board of Governors
Labor markets need to strengthen further for additional “chasing”.

Nonfarm Employment Change and Unemployment Rate

Source: Bureau of Labor Statistics
What Does It Mean for Agriculture?
Rising farm incomes spur capital spending.

Source: USDA and Association of Equipment Manufacturers
Note: 2011 Agricultural Equipment Sales are YTD through March
Good Quality (Non-irrigated) Farmland Values
(Percent change fourth quarter 2009 to fourth quarter 2010)

Source: Federal Reserve District Surveys (Chicago, Minneapolis, Kansas City, Dallas)
Agriculture faces huge interest rate risk – Incomes rise in low interest rate environments.

**Farm Incomes and Interest Rates**

- **Constant 2005 dollars (billions)**
- **Percent**

**Sources:** USDA, Federal Reserve, BLS
Agriculture faces huge interest rate risk – capitalization rates move with interest rates

Interest Rates and Implied Capitalization Rates

Sources: USDA, Federal Reserve, BLS
Agriculture faces huge interest rate risk – farmland values fall under higher interest rates

\[ \text{Capitalized Land Values} = \frac{\text{Expected Incomes}}{\text{Expected Discount Rates}} \]

- Farm Incomes Rise with Lower Interest Rates
- Discount Rates Fall with Lower Interest Rates

What Happens to Farmland Values Under Higher Interest Rates?
How much debt do farmers really have?

Growth in Farm Real Estate and Non-Real Estate Debt (2009 to 2010)

Source: USDA, Agricultural Finance Databook, Federal Farm Credit Banks
Agricultural financing will be constrained if delinquency rates remain elevated.

**Delinquent Farm Loans Held by Insured Commercial Banks**

Source: Agricultural Finance Databook, Federal Reserve Bank of Kansas City
Exchange rate movements affect commodity prices.

Commodity Prices and the Dollar

Source: Commodity Research Bureau and Federal Reserve
What is the role of the funds in the market?

Net Long Positions of Money Managers and Corn Prices

Source: USDA and CFTC
Will China be effective in slowing their economy with higher interest rates?

China’s Inflation and Interest Rates

- Interest Rate on One Year Deposits (Left Scale)
- Consumer Price Inflation: 12-month (Right Scale)
Export activity shapes agricultural prices.

**U.S. Corn Exports and Prices**

- **X-axis:** Thousand metric ton
- **Y-axis:** Dollars per bushel

Source: USDA and Commodity Research Bureau
How does U.S. consumers respond to higher food prices?

Retail Sales at Grocery Stores and Restaurants

Percent change from previous year

Source: Census Bureau
Poorer nations and low-income populations struggle under high food prices.

Food Share of Household Expenditure by Country, 2009

- Pakistan: 45.7%
- Algeria: 43.9%
- Jordan: 40.9%
- Egypt: 38.8%
- China: 34.9%
- India: 32.4%
- Brazil: 24.6%
- Japan: 14.6%
- Germany: 11.4%
- Canada: 9.2%
- U.S.: 6.9%

Source: USDA
What is the future for bio-fuels?

U.S. Ethanol Production Capacity and Production

Billion gallons

Source: Renewable Fuels Association, capacity data based on January information
What happens to agricultural production costs with higher commodity prices?

Prices Paid by Farmers

Index (1990 to 1992 average = 100)

Source: USDA
The Best Cure for High Prices is High Prices

Farmers Always Produce Themselves Out of Prosperity

- 2011: U.S. Acres Planted to Corn Up 4.3%
- 2020: U.S. Corn Yields Up 17 Percent

How Quickly Could Farm Incomes Fall?

- 2013: Average Annual Corn Price is $4.10
- 2013: Net returns above variable costs for corn fall 40% below today’s levels.

Source: USDA
What is the long-term profits from agricultural production?

Net Returns to Corn Production

FAPRI: Corn price ranges from $4.66 to $4.77 per bushel

USDA: Corn price ranges from $4.10 to $4.25 per bushel

Source: USDA and FAPRI
Conclusions

- The economic recovery is underway.
- Agriculture faces two types of risks:
  - Agricultural market risks
  - Financial market risks.
- The risk are large and constantly shifting
- Agriculture will continue to face volatile markets.

*Low leverage ratios and strong working capital are the best way to manage through volatile times.*