Is This Farm Boom Different?
A Farm Boom starting in 1900.

Colorado, Kansas and Nebraska Farm Real Estate Values
1900

$Dollars per Acre
Constant 2011 dollars
- Green: 0 - $499
- Blue: $500 - $999
- Yellow: $1000 - $1999
- Orange: $2000 - $2999
- Red: $3000 and up

Source: USDA
WWI and the “Golden Era for Agriculture” boost farmland values.

Colorado, Kansas and Nebraska Farm Real Estate Values
1920

$Dollars per Acre
Constant 2011 dollars
- 0 - $499
- $500 - $999
- $1000 - $1999
- $2000 - $2999
- $3000 and up

Source: USDA
Farmland values decline during the “Roaring 20s”

Colorado, Kansas and Nebraska Farm Real Estate Values
1930

$\text{Dollars per Acre}
\text{Constant 2011 dollars}
- 0 - $499
- $500 - $999
- $1000 - $1999
- $2000 - $2999
- $3000 and up

Source: USDA
The Great Depression pushed down farmland values further.

Colorado, Kansas and Nebraska Farm Real Estate Values

1940

$Dollars per Acre
Constant 2011 dollars
- 0 - $499
- $500 - $999
- $1000 - $1999
- $2000 - $2999
- $3000 and up

Source: USDA
World War II and rising global demand boosted exports.

Colorado, Kansas and Nebraska Farm Real Estate Values 1950

$Dollars per Acre
Constant 2011 dollars
- 0 - $499
- $500 - $999
- $1000 - $1999
- $2000 - $2999
- $3000 and up

Source: USDA
Enhanced productivity and rising exports lifts farmland values during the 1950s and 1960s.

Colorado, Kansas and Nebraska Farm Real Estate Values
1959

$Dollars per Acre
Constant 2011 dollars
- 0 - $499
- $500 - $999
- $1000 - $1999
- $2000 - $2999
- $3000 and up

Source: USDA
Enhanced productivity and rising exports lifts farmland values during the 1950s and 1960s.

Colorado, Kansas and Nebraska Farm Real Estate Values 1969

$Dollars per Acre
Constant 2011 dollars

- Green: 0 - $499
- Blue: $500 - $999
- Yellow: $1000 - $1999
- Orange: $2000 - $2999
- Red: $3000 and up

Source: USDA
The Russian grain deal sparks the farm real estate boom.

Colorado, Kansas and Nebraska Farm Real Estate Values
1974

$Dollars per Acre
Constant 2011 dollars

- Green: 0 - $499
- Blue: $500 - $999
- Yellow: $1000 - $1999
- Orange: $2000 - $2999
- Red: $3000 and up

Source: USDA
By the late 1970s, farmland values are “hot”.

Colorado, Kansas and Nebraska Farm Real Estate Values
1978

$Dollars per Acre
Constant 2011 dollars
- 0 - $499
- $500 - $999
- $1000 - $1999
- $2000 - $2999
- $3000 and up

Source: USDA
Higher interest rates and trade restrictions begin to cool land values.

Colorado, Kansas and Nebraska Farm Real Estate Values
1982

$Dollars per Acre
Constant 2011 dollars
- 0 - $499
- $500 - $999
- $1000 - $1999
- $2000 - $2999
- $3000 and up

Source: USDA
At the end of the crisis land values are almost back to 1959 levels.

Colorado, Kansas and Nebraska Farm Real Estate Values 1987

$Dollars per Acre
Constant 2011 dollars
- Green: 0 - $499
- Blue: $500 - $999
- Yellow: $1000 - $1999
- Orange: $2000 - $2999
- Red: $3000 and up

Source: USDA
The Foundation of Agriculture’s Boom/Bust Cycles
The Foundations of Agricultural Cycles

What Ignites a Farm Boom?

**The Kindling:**
- Tight Global Supplies

**The Wood:**
- Strong Global Demand

**The Matches:**
- Low Interest Rates & Value of the Dollar

**The Gas Can:**
- Debt and Leverage
Is agriculture set up for another correction?

U.S. Corn Prices and Farm Real Estate Values

Dollars per acre (Constant 2011 dollars)

Dollars per bushel

Source: USDA
Elevated export trends similar to the 1950s could keep farm prices high.

U.S. Agricultural Exports and Farm Prices

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?

FARM DEBT

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.
What are the long-term risks to agriculture?
Will export demand continue to grow?

China’s GDP Growth and Ag Imports from U.S.

Source: USDA

Note: 2012 Agricultural Imports forecast based on year-to-date 2012 annual growth rate.
Ethanol hits the “Blend Wall”

U.S. Motor Gasoline Use
Fell 2.6% in 2011
2015 forecast down 5%

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

Projections of 2015 Ethanol Consumption
In 2007, 15 billion gallons
Today, 13.7 billion gallons

Current Ethanol Production Capacity
13.5 billion gallons with
522 million gallons under construction

Source: EIA
What is the supply response of farmers from higher prices?

U.S. Corn Inventories and Prices

Source: USDA actual data and agricultural projections to 2021
How does federal government debt affect farm policy?

Federal Government Debt as a Percent of GDP

Source: Congressional Budget Office
How much debt capacity does U.S. agriculture actually have?

*Forecast for 2011

Note: Farm sector debt does not include debt for operators’ dwellings or for nonfarm uses. Maximum feasible debt is based on farm income and does not reflect nonfarm sources of debt repayment.

Source: Economic Research Service, USDA.
Debt is being used to finance land purchases.

Financing Farmland Purchases in the Tenth District

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

Source: Federal Reserve Bank of Kansas City
What will happen to non-real-estate debt?

How much cash have farmers used to pay for equipment, machinery, grain bins, machine sheds, pivots, etc?

U.S. Tractor and Combine Sales

Source: Association of Equipment Manufacturers
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 or interest rates rise?

**Net Present Values tell us that**

**Land Values should equal expected capitalized revenues**

**Capitalized Value Formula**

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

30% is land’s share of Total production costs.

<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>4,800</td>
</tr>
<tr>
<td>4%</td>
<td>3,600</td>
</tr>
<tr>
<td>5%</td>
<td>2,880</td>
</tr>
<tr>
<td>6%</td>
<td>2,400</td>
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<tr>
<td>7%</td>
<td>2,057</td>
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<tr>
<td>8%</td>
<td>1,800</td>
</tr>
</tbody>
</table>

Assumption corn yields 160 bushels per acre.
Conclusions

- Agriculture appears to be in another farm boom.
- Rising export activity, a low U.S. dollar, and low interest rates are fueling the boom.
- Going forward, agriculture faces many risks.
- The striking difference is farm debt.

*If margins narrow, will farmers leverage long-term assets to build working capital?*
To Receive an Invitation to the Federal Reserve Bank of Kansas City’s 2012 Agricultural Symposium

Please email

AgSymposium@kc.frb.org