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# Is This Farm Boom Different?

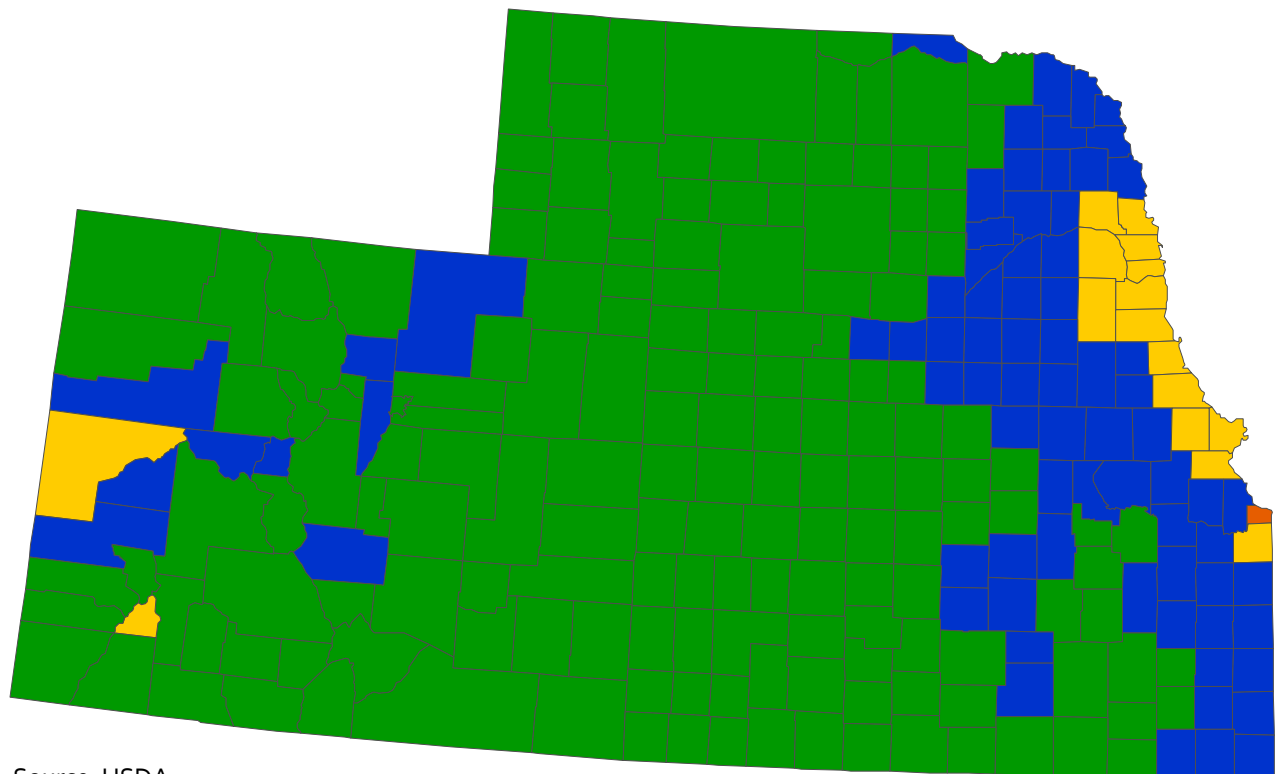


The views expressed are those of the author and do not necessarily reflect the opinions of the Federal Reserve Bank of Kansas City or the Federal Reserve System.

# A Farm Boom starting in 1900.

## Colorado, Kansas and Nebraska Farm Real Estate Values 1900

\$Dollars per Acre  
Constant 2011 dollars



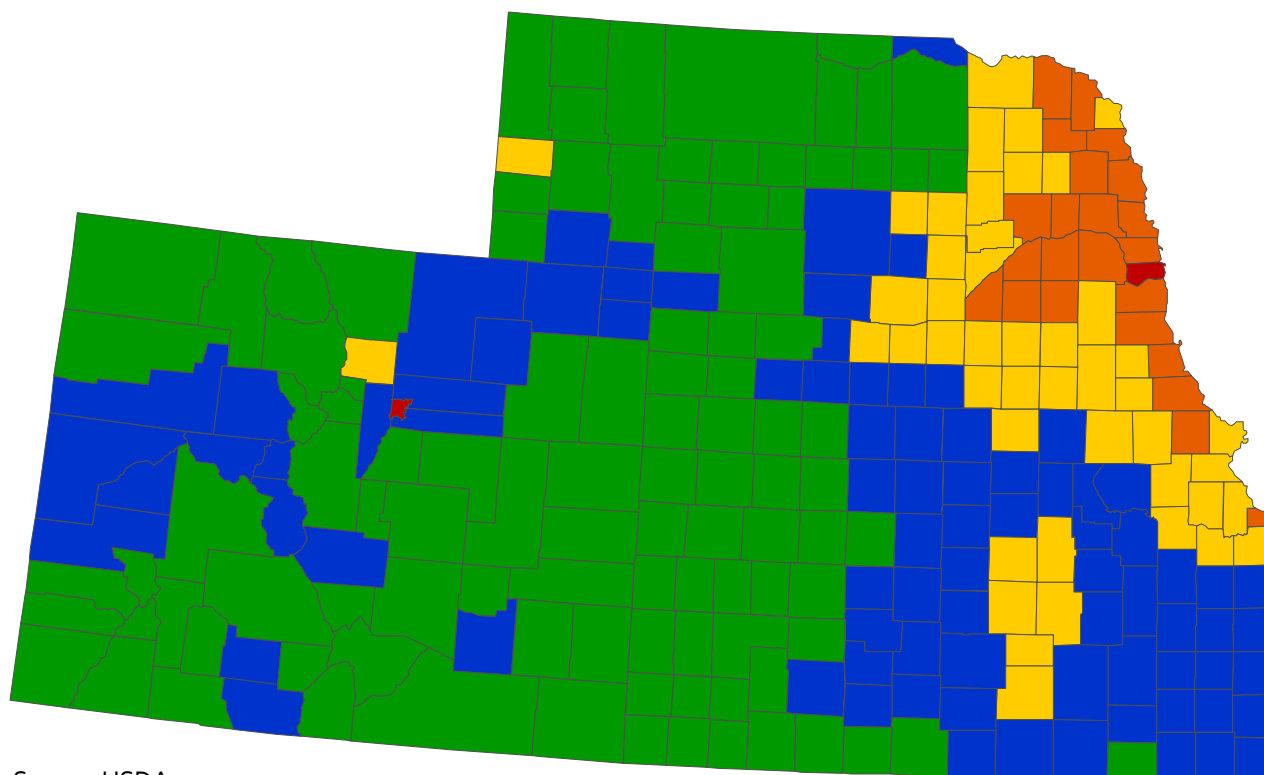
Source: USDA



# 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



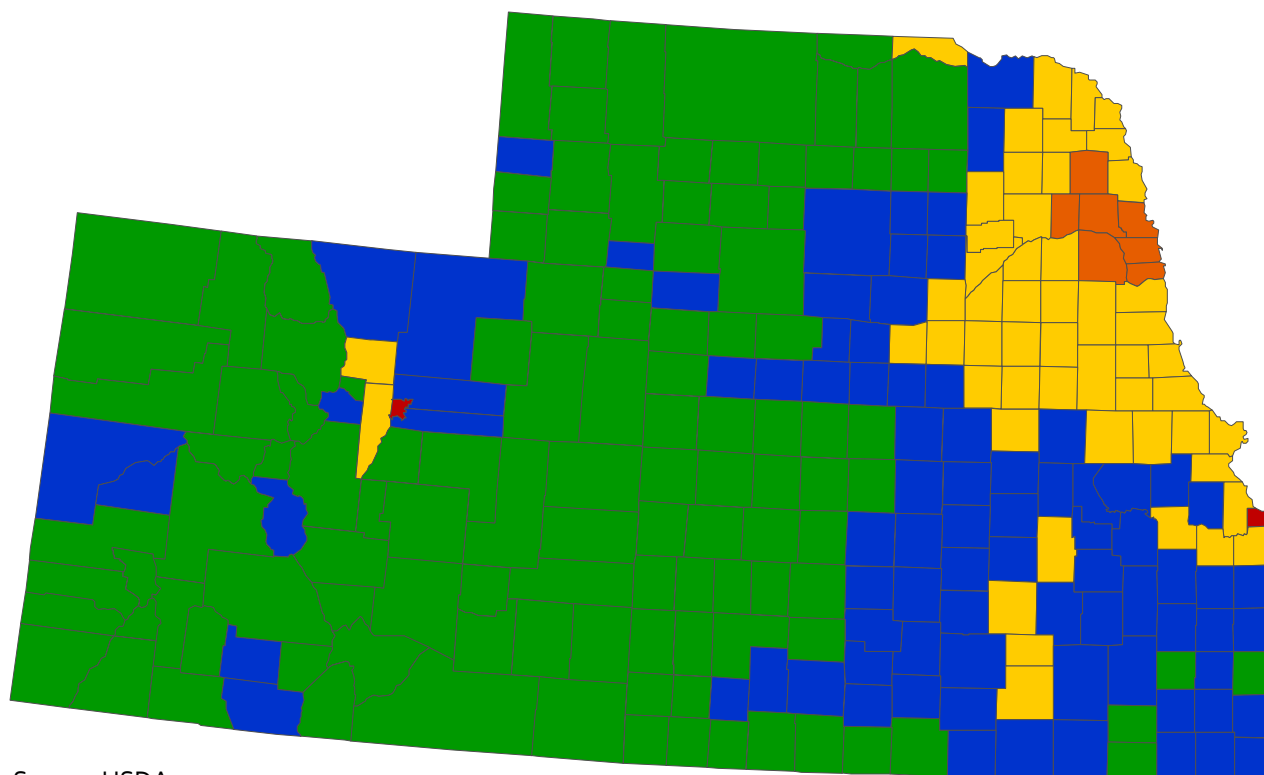
Source: USDA



# Farmland values decline during the "Roaring 20s"

## Colorado, Kansas and Nebraska Farm Real Estate Values 1930

\$Dollars per Acre  
Constant 2011 dollars



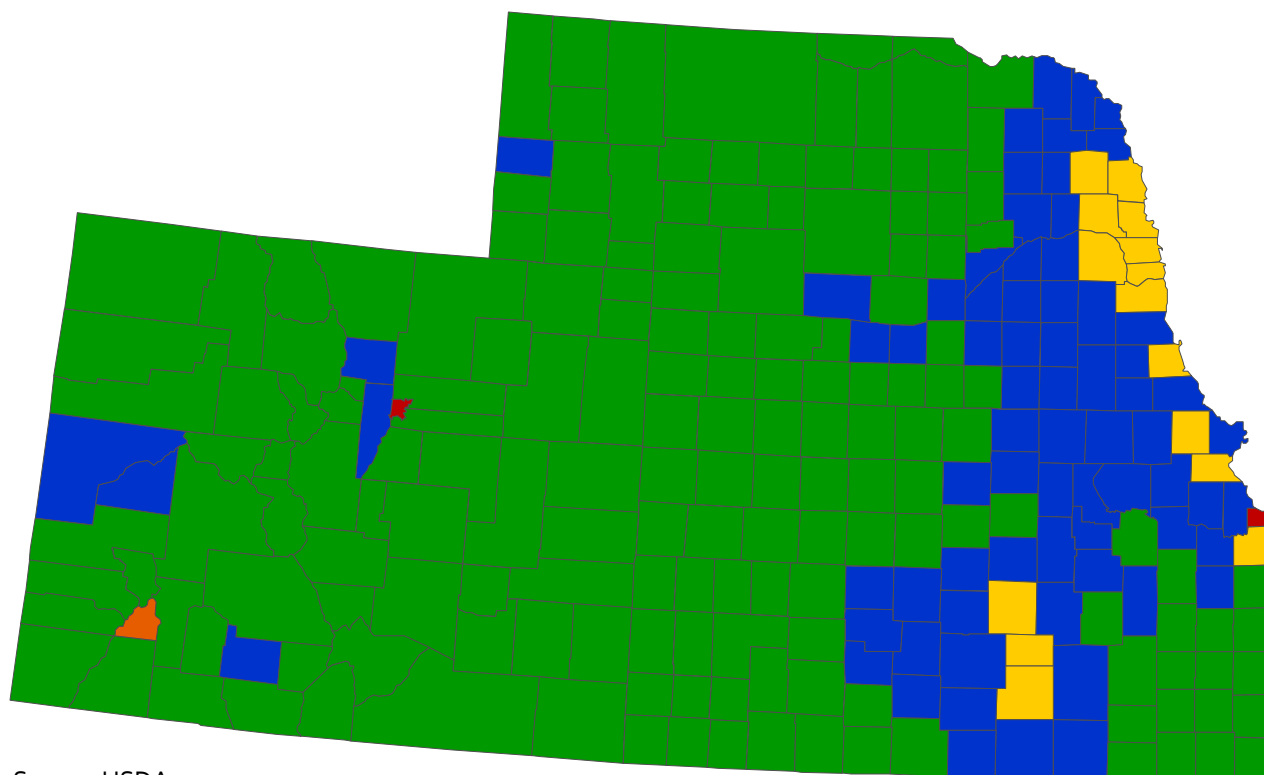
Source: USDA



# The Great Depression pushed down farmland values further.

## Colorado, Kansas and Nebraska Farm Real Estate Values 1940

\$Dollars per Acre  
Constant 2011 dollars



Source: USDA

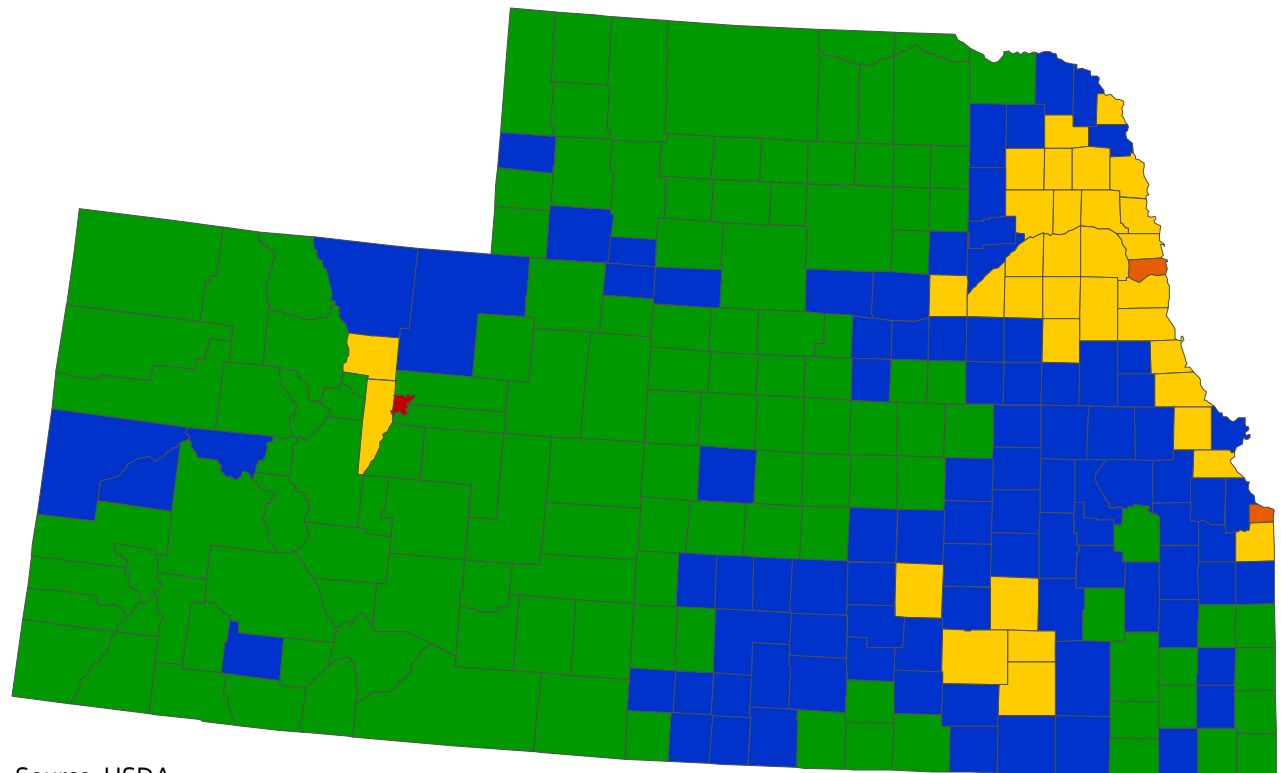


# World War II and rising global demand boosted exports.

## 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



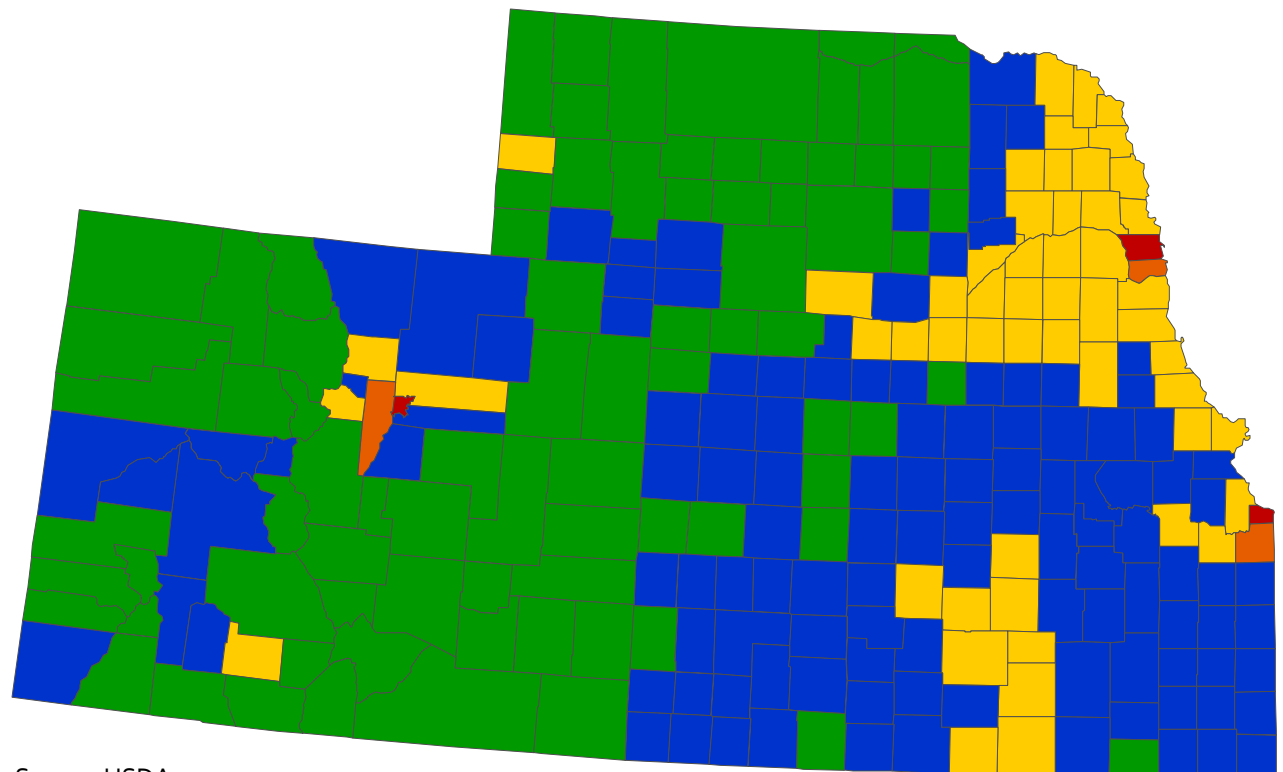
Source: USDA



# 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



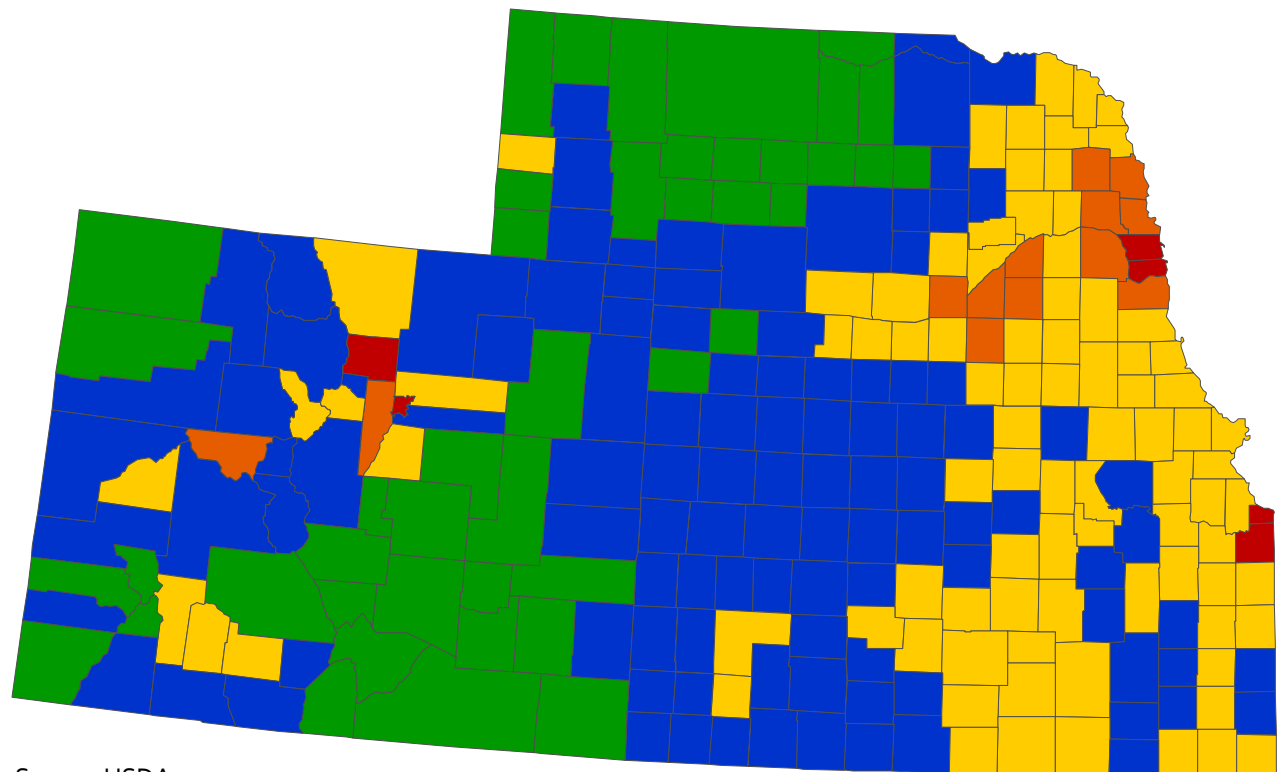
Source: USDA



# 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



Source: USDA

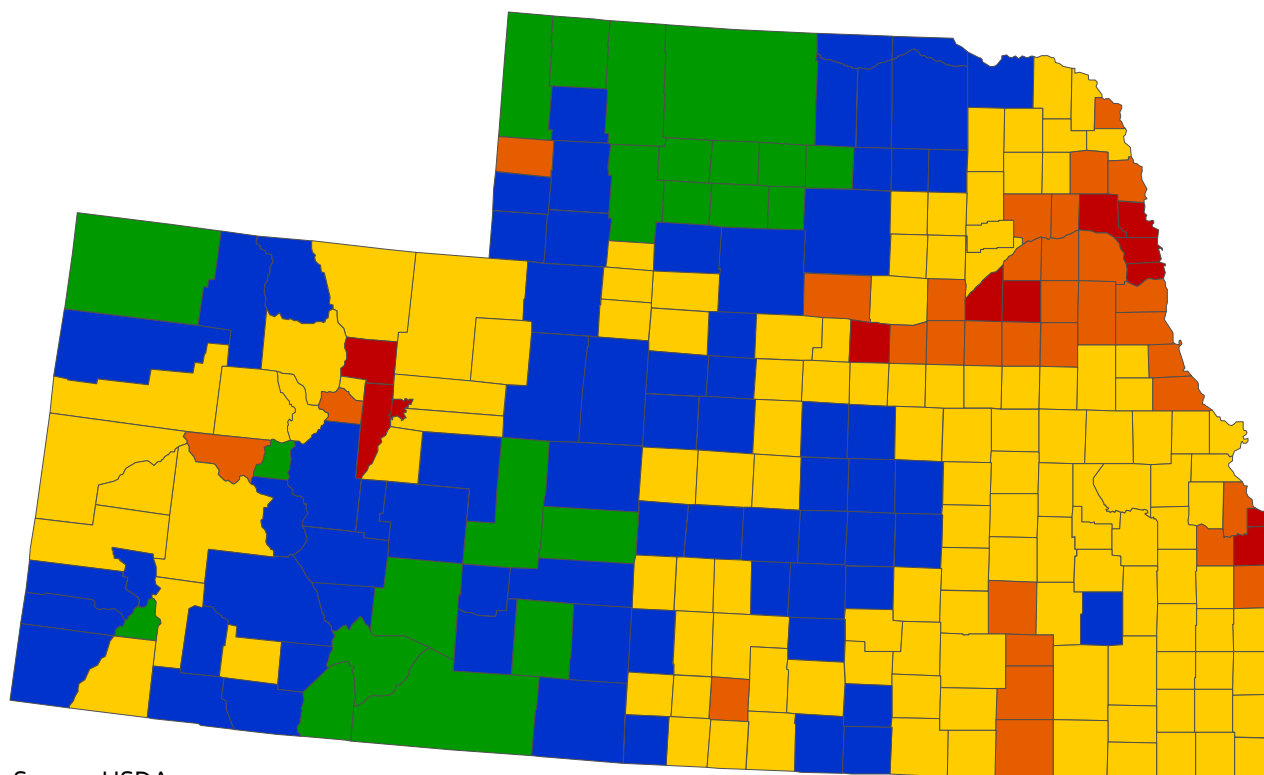




# The Russian grain deal sparks the farm real estate boom.

## Colorado, Kansas and Nebraska Farm Real Estate Values 1974

\$Dollars per Acre  
Constant 2011 dollars



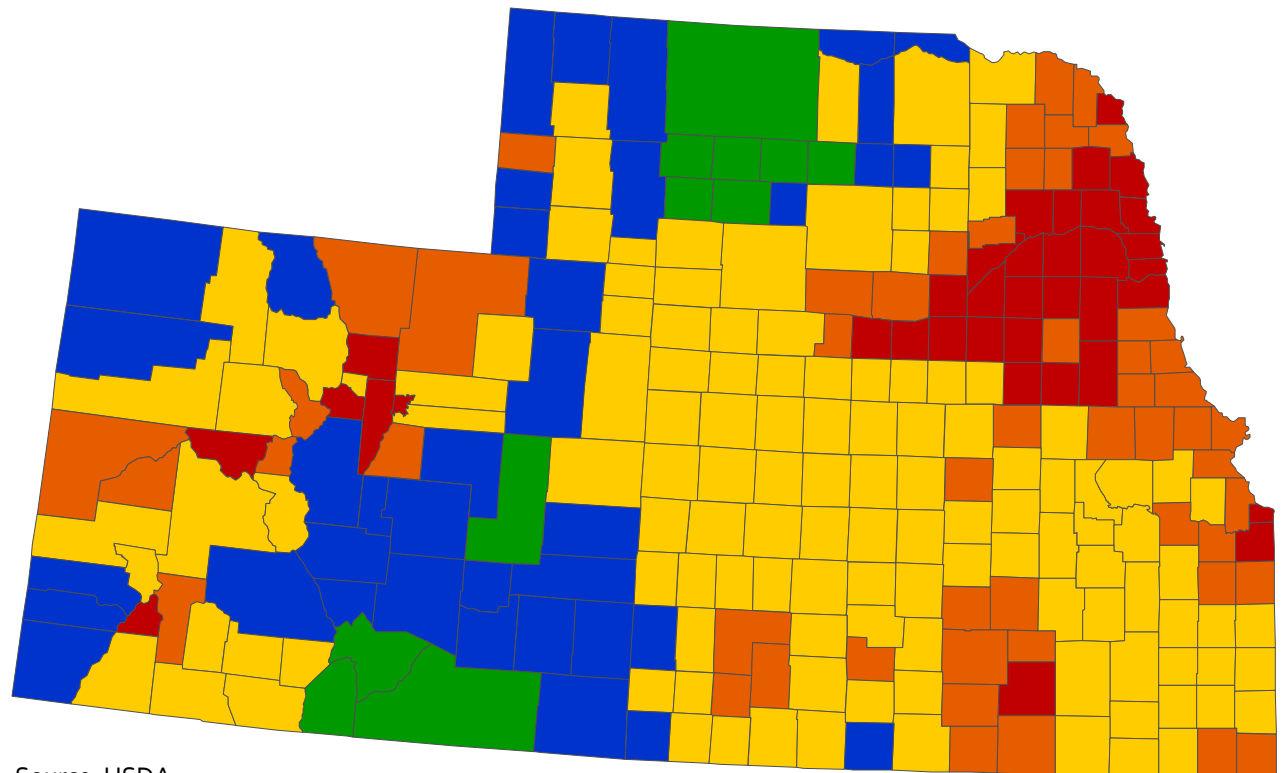
Source: USDA



# By the late 1970s, farmland values are "hot".

## Colorado, Kansas and Nebraska Farm Real Estate Values 1978

\$Dollars per Acre  
Constant 2011 dollars



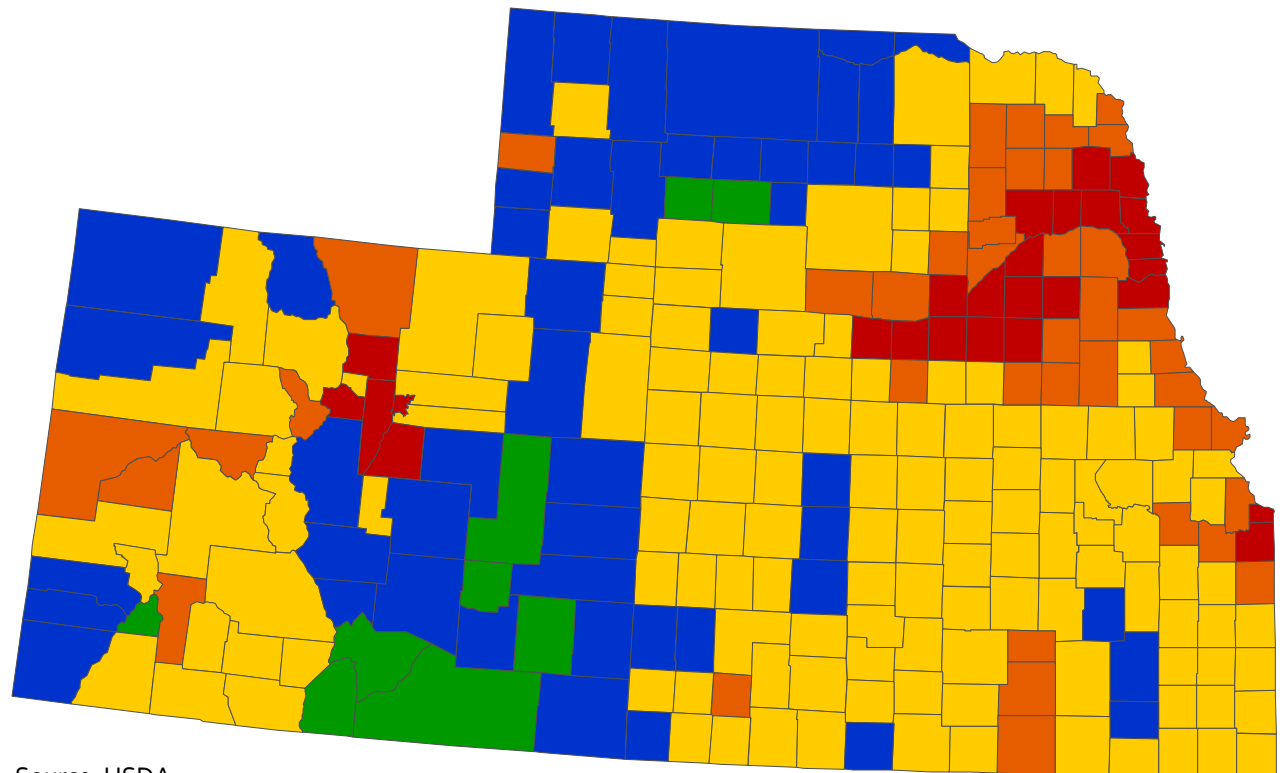
Source: USDA



# 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



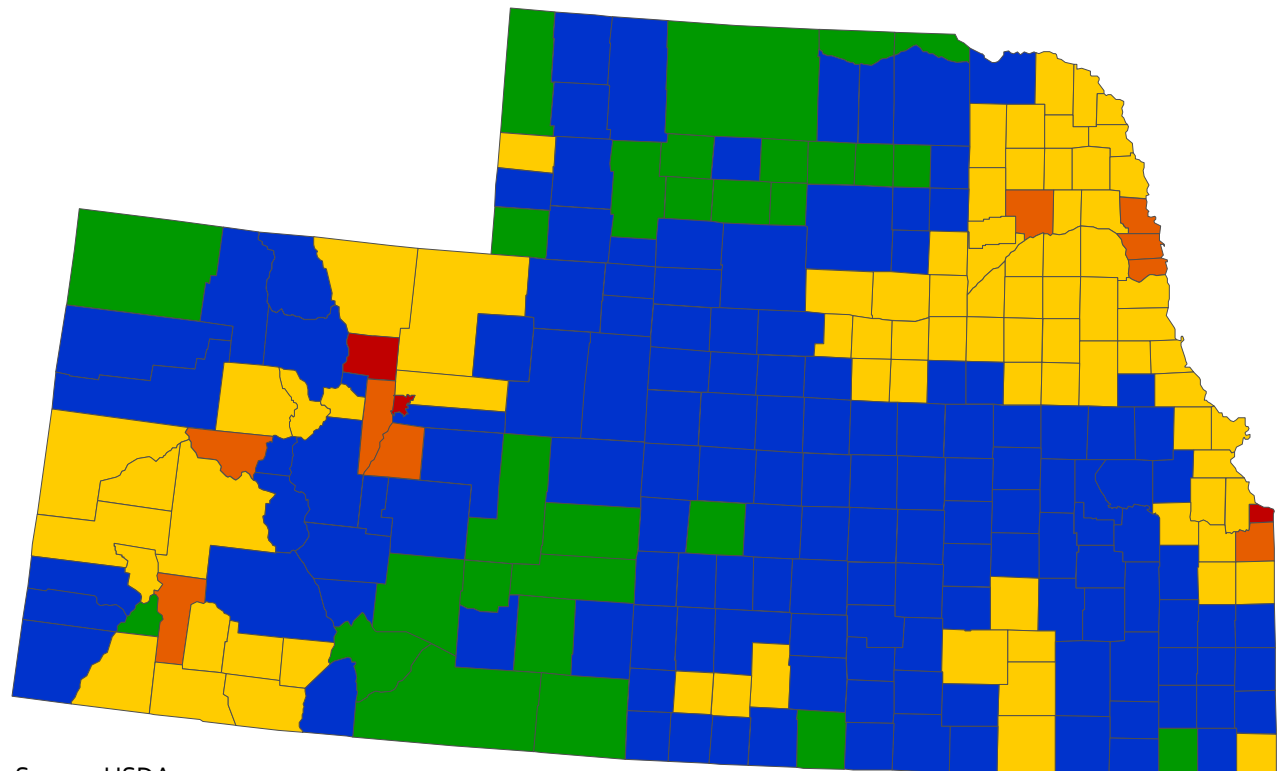
Source: USDA



# 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



Source: USDA



# The Foundation of Agriculture's Boom/Bust Cycles

BOOM/BUST CYCLES



# The Foundations of Agricultural Cycles

## What Ignites a Farm Boom?



### The Actors

The Kindling:  
Tight Global Supplies

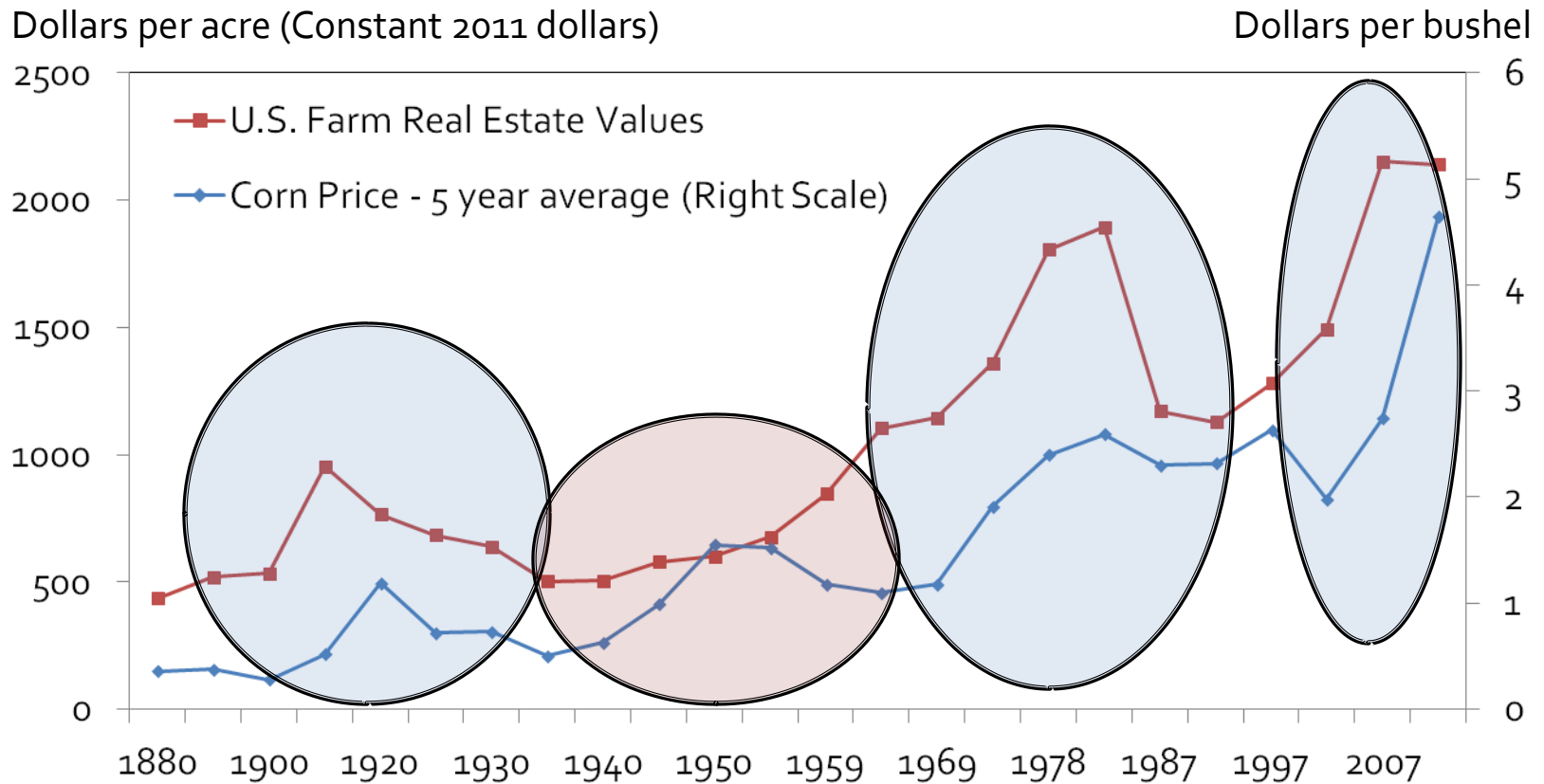
The Wood:  
Strong Global Demand

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

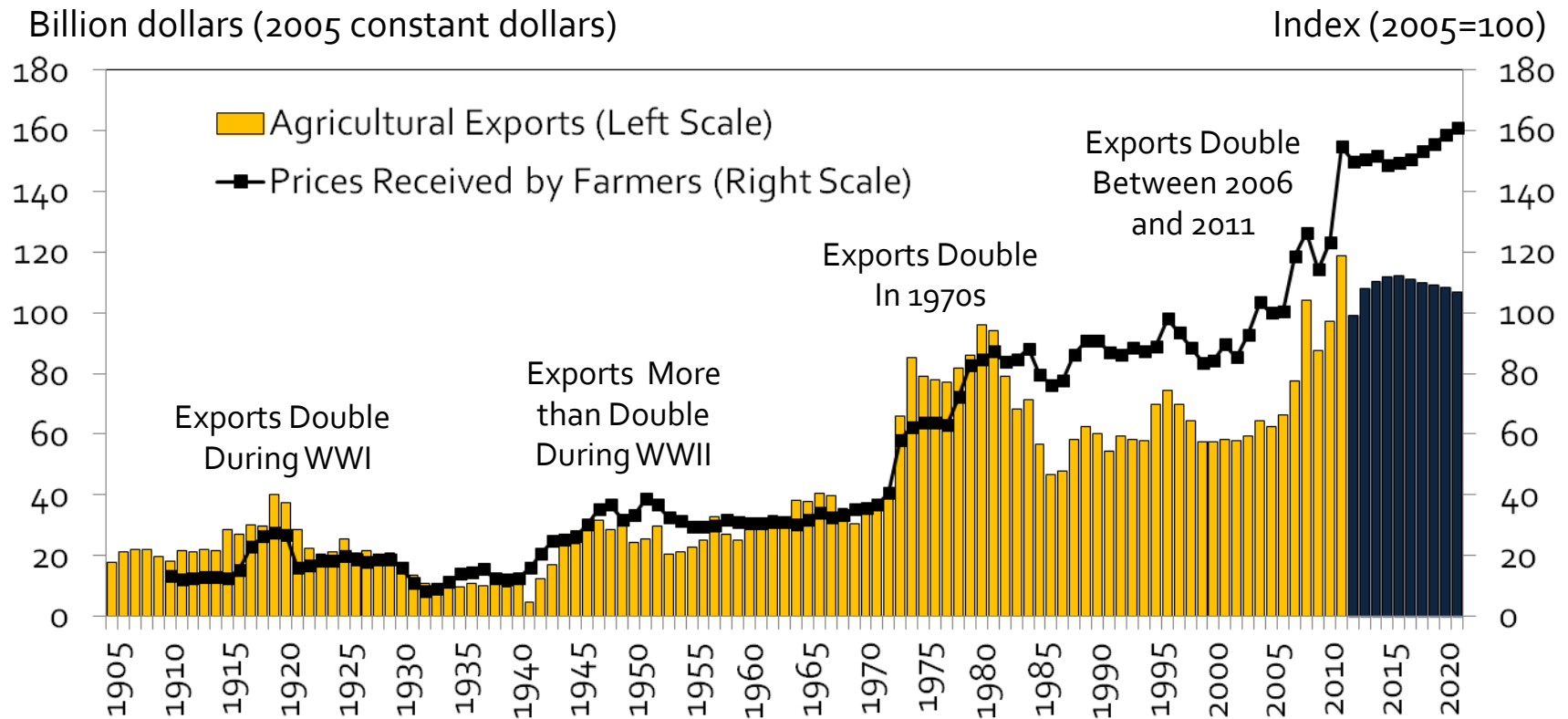


Source: USDA



# Elevated export trends similar to the 1950s could keep farm prices high.

## U.S. Agricultural Exports and Farm Prices



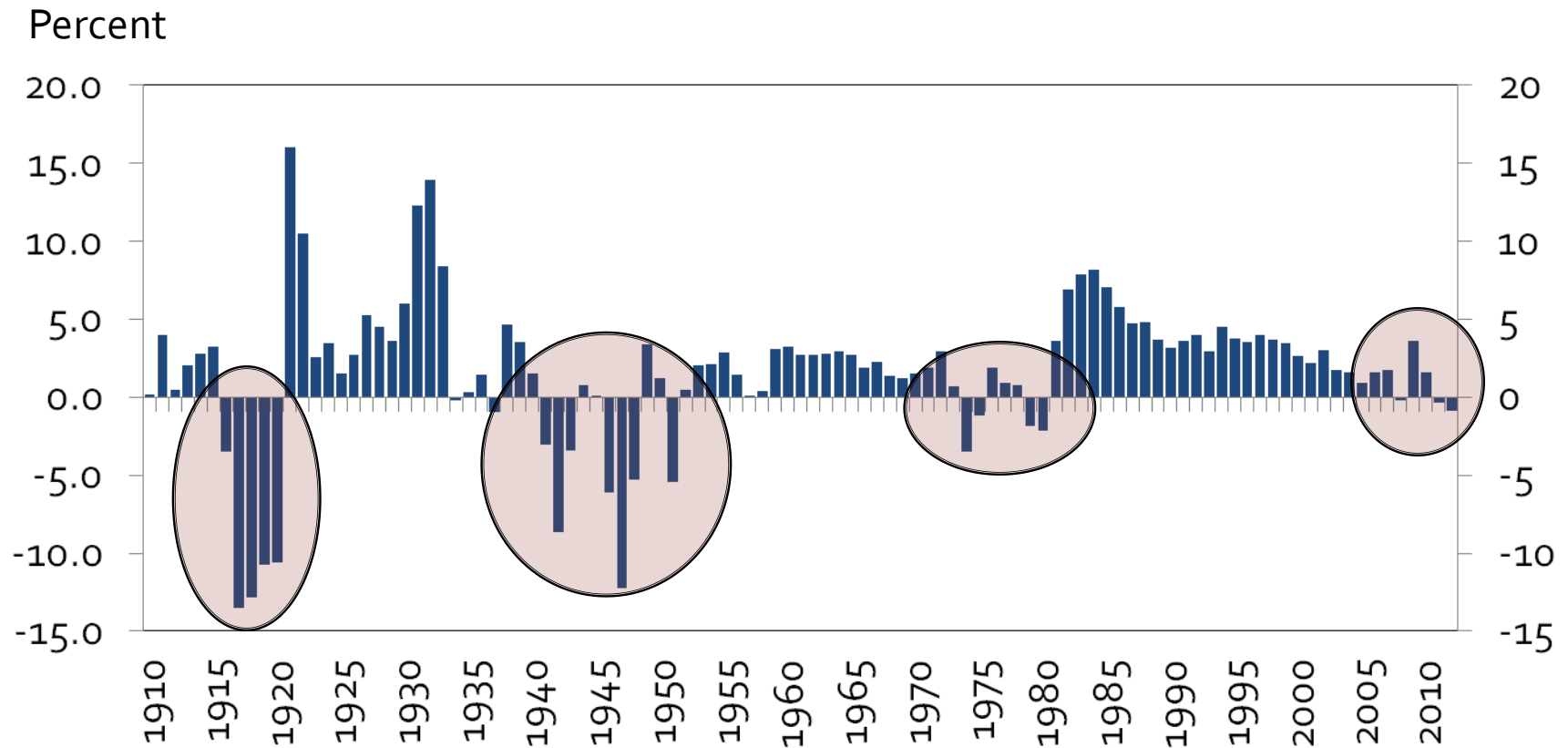
Calculations based on U.S. Census Bureau and U.S. Department of Agriculture data deflated with consumer price index from the Federal Reserve Bank of Minneapolis and USDA inflation expectations.





# 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.

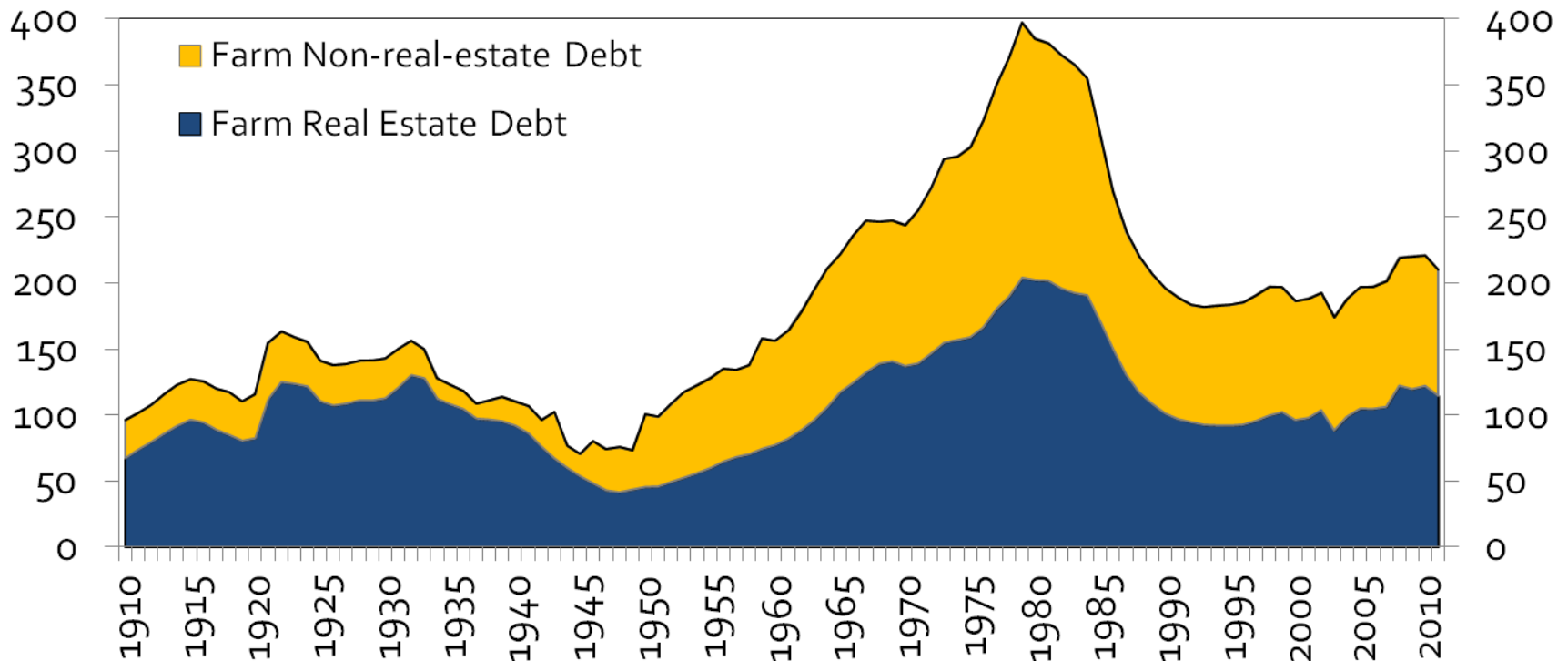


# What made the 1940s different?

## 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.



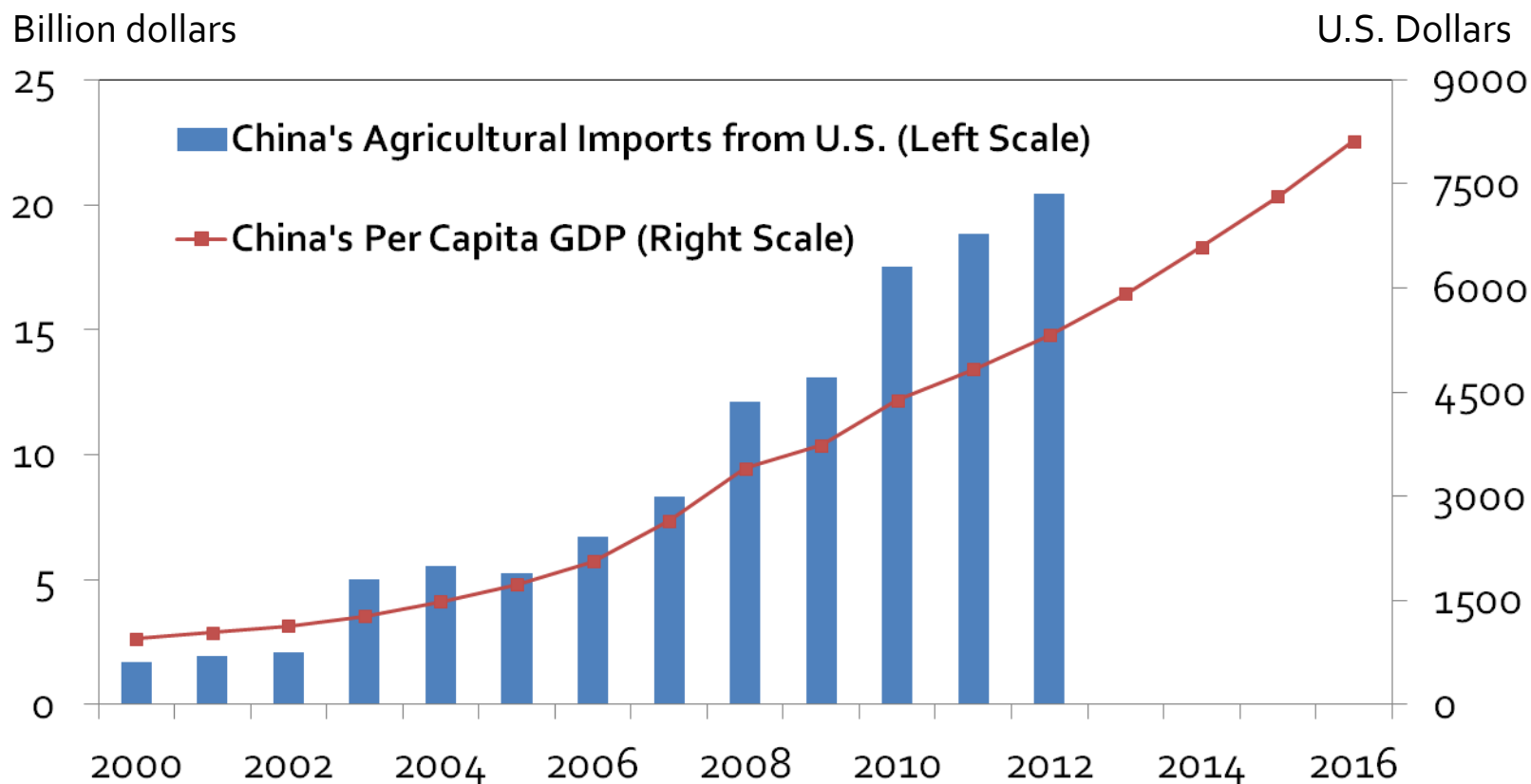
# What are the long-term risks to agriculture?

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.

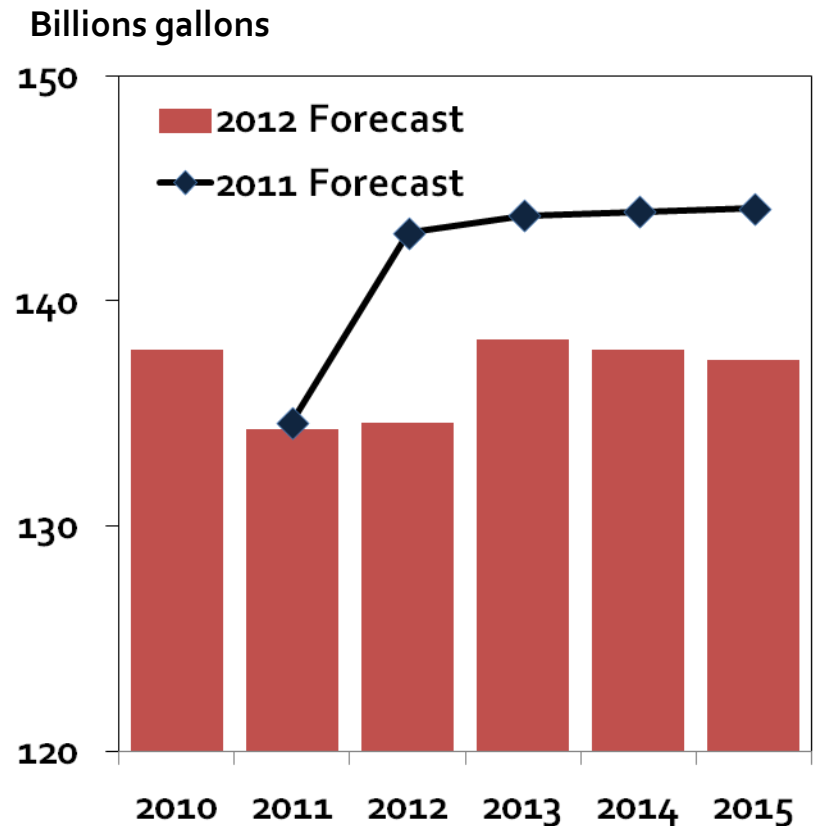
## Projections of 2015 Ethanol Consumption

In 2007, 15 billion gallons  
Today, 13.7 billion gallons

## Current Ethanol Production Capacity

13.5 billion gallons with  
522 million gallons under construction

## U.S. Motor Gasoline Consumption

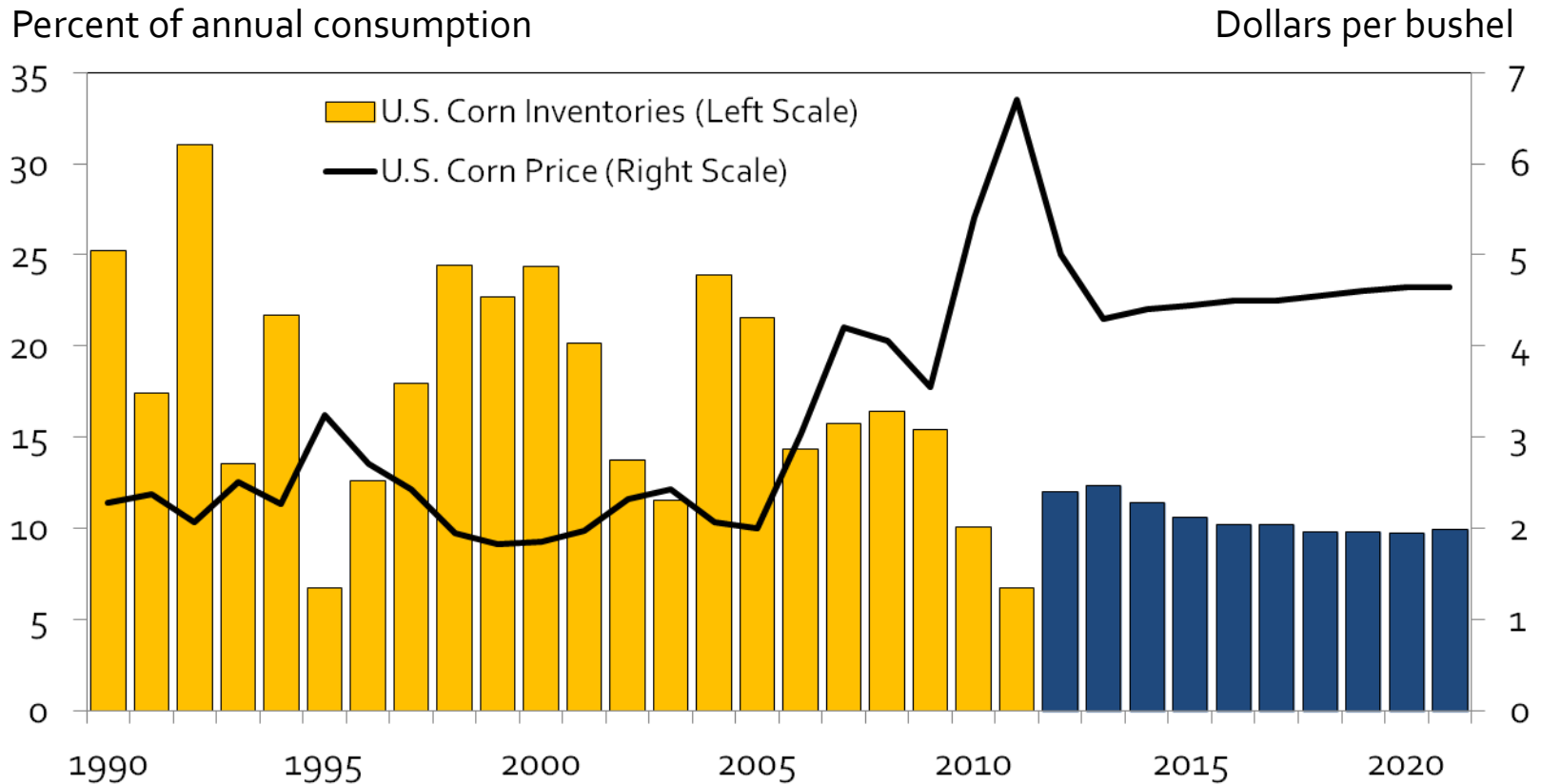


Source: EIA



# What is the supply response of farmers from higher prices?

U.S. Corn Inventories and Prices

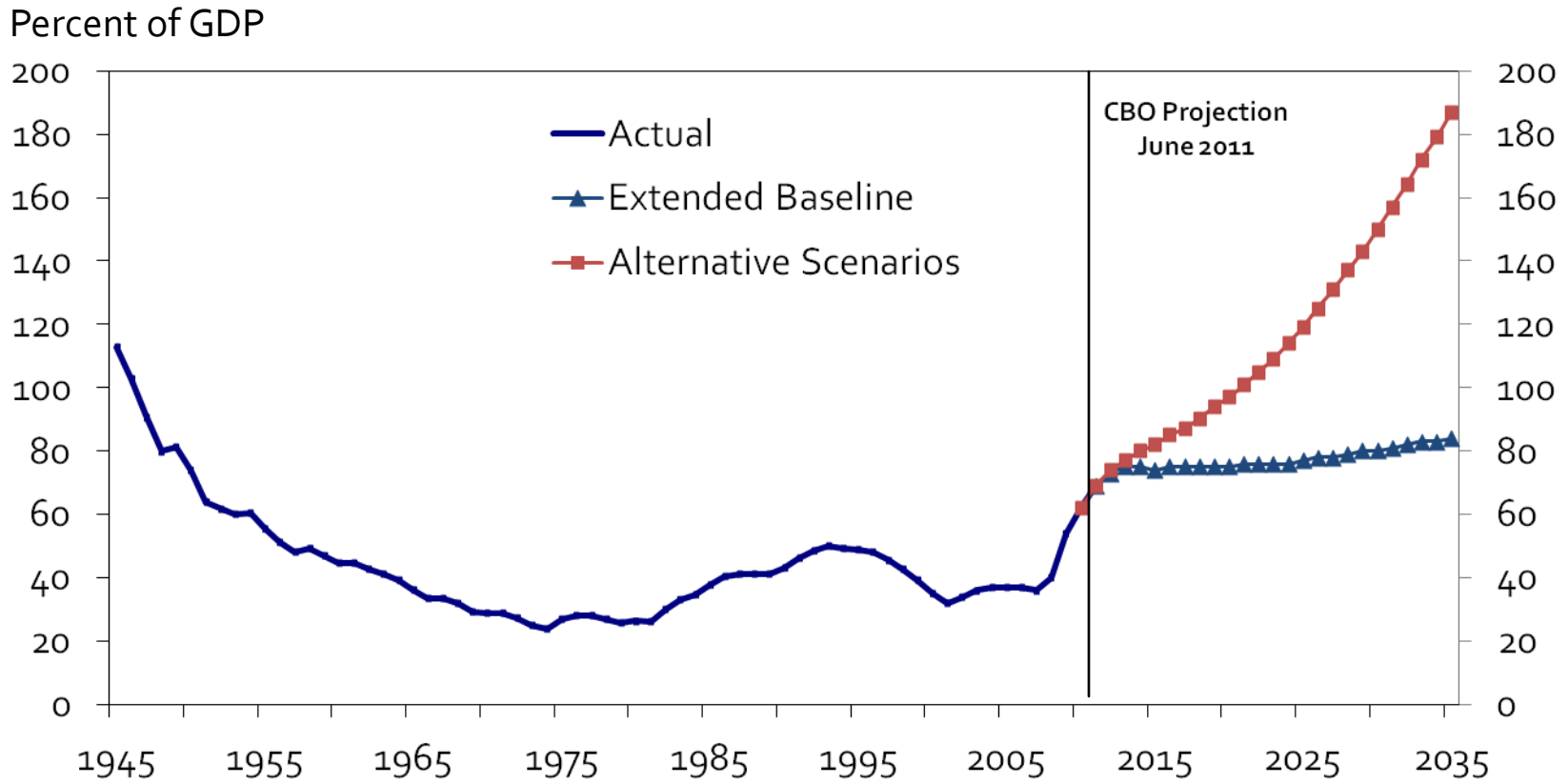


Source: USDA actual data and agricultural projections to 2021



# How does federal government debt affect farm policy?

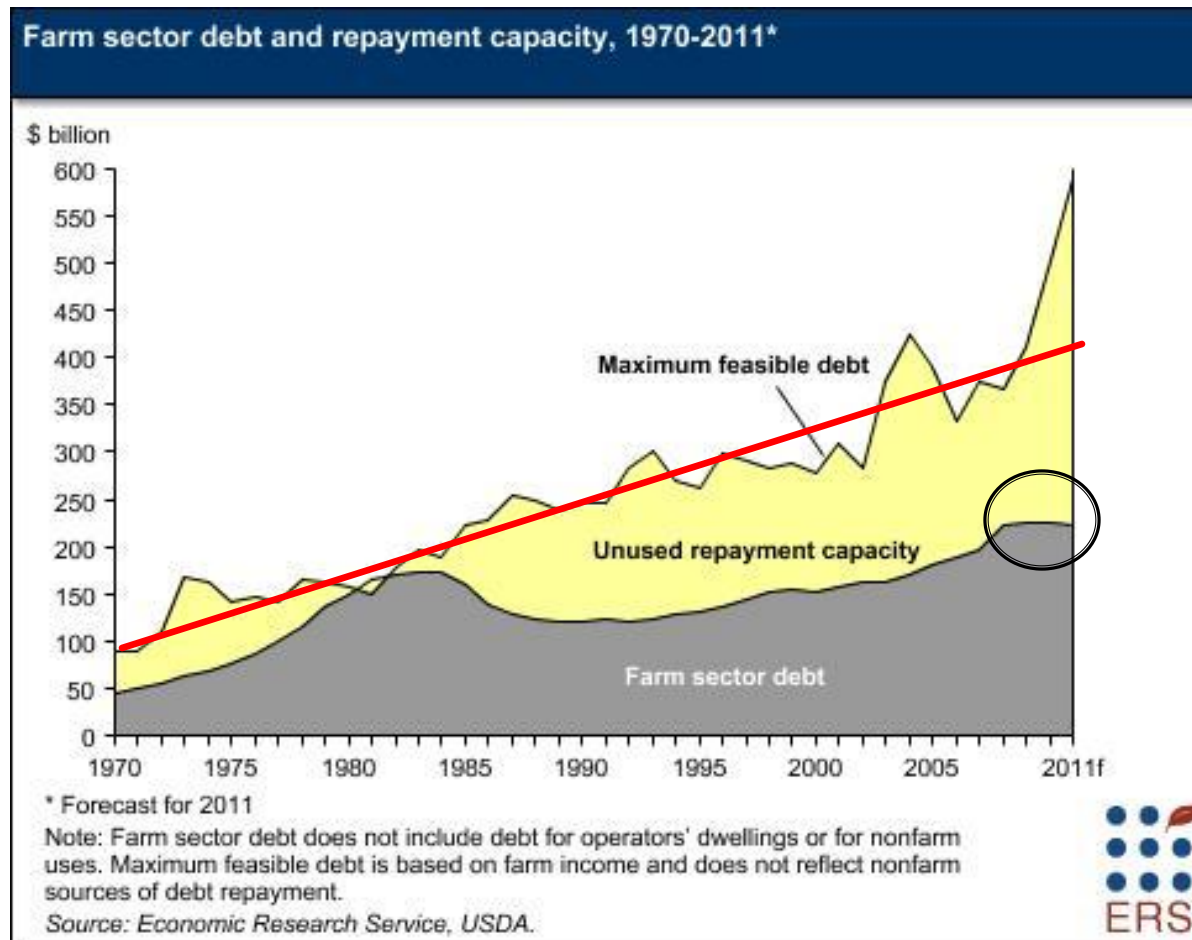
## Federal Government Debt as a Percent of GDP



Source: Congressional Budget Office



# How much debt capacity does U.S. agriculture actually have?

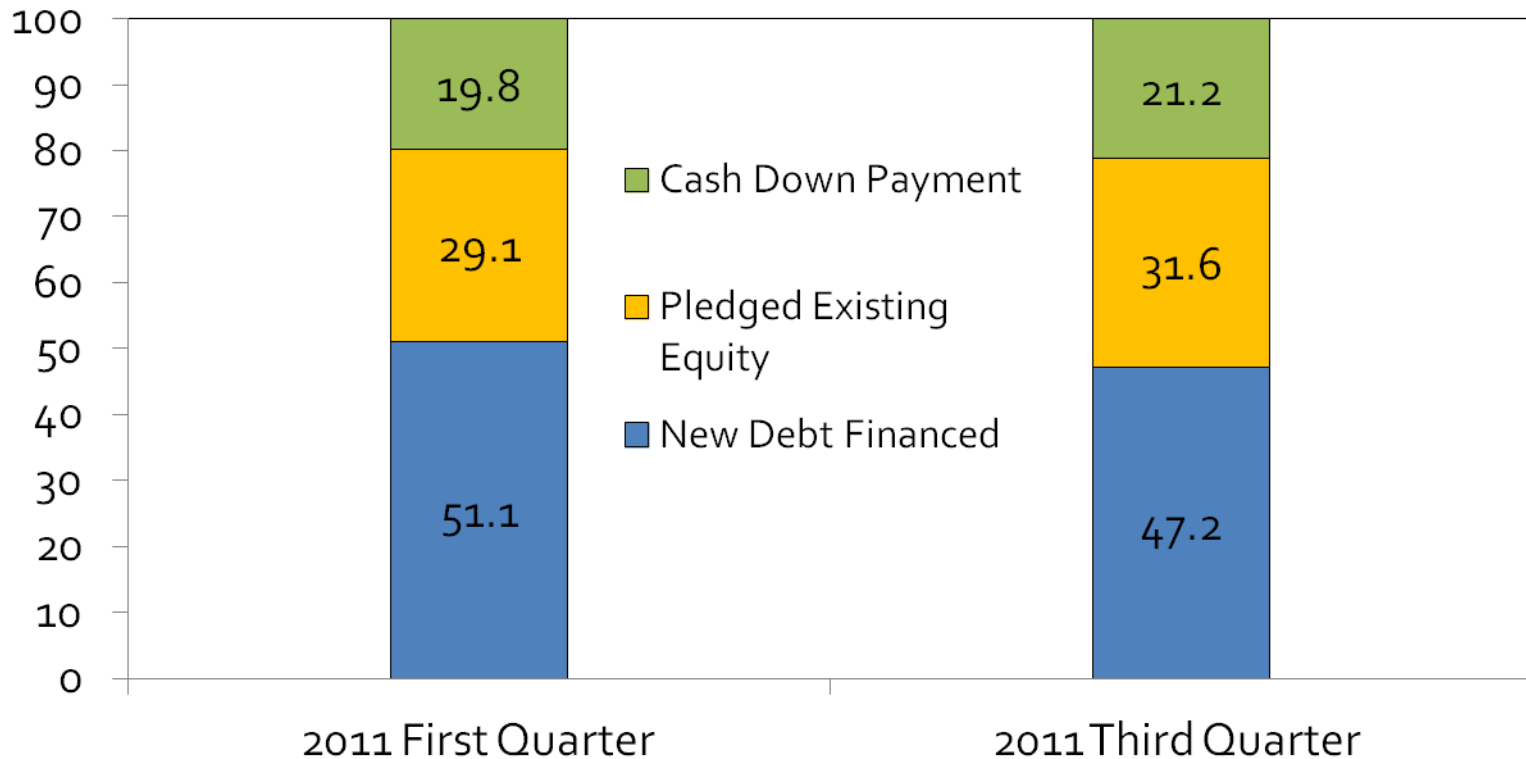




# Debt is being used to finance land purchases.

## Financing Farmland Purchases in the Tenth District

Percent of total financing



Source: Federal Reserve Bank of Kansas City



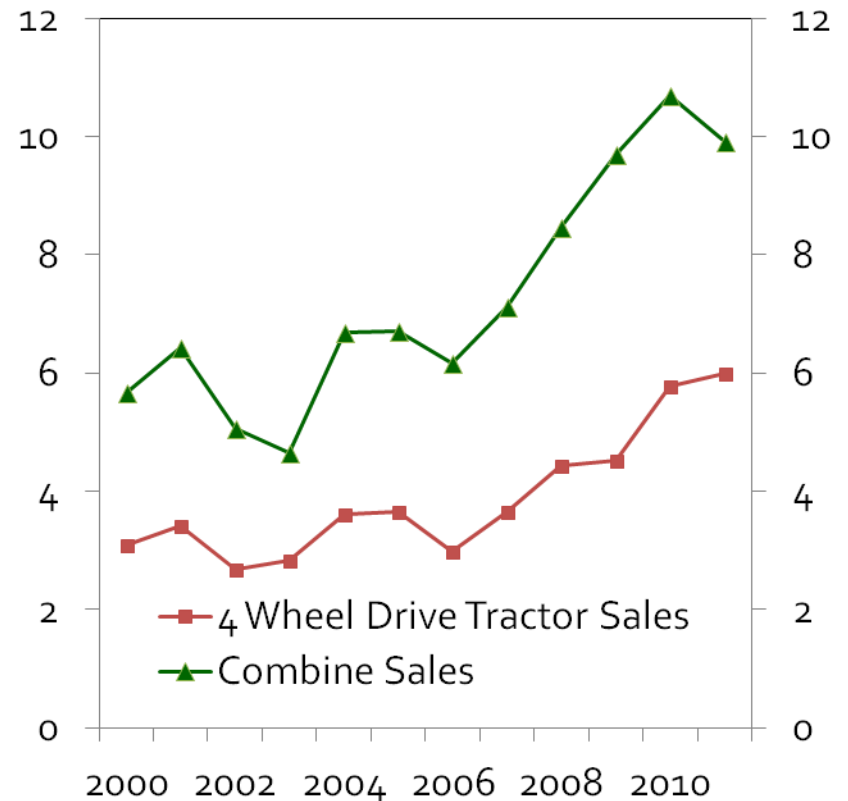
# What will happen to non-real-estate debt?



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

## U.S. Tractor and Combine Sales

Thousand units per month



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**

$$\frac{30\% \text{ of Expected Price} * \text{Yield}}{\text{Expected Capitalization Rate}}$$

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

Corn Price (dollars per bushel)

	\$3.00	\$4.00	\$5.00	\$6.00	\$7.00	\$8.00
3%	4,800	6,400	8,000	9,600	11,200	12,800
4%	3,600	4,800	6,000	7,200	8,400	9,600
5%	2,880	3,840	4,800	5,760	6,720	7,680
6%	2,400	3,200	4,000	4,800	5,600	6,400
7%	2,057	2,743	3,429	4,114	4,800	5,486
8%	1,800	2,400	3,000	3,600	4,200	4,800

Assumption corn yields 16 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?*





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