

Farmland

IN PERSPECTIVE

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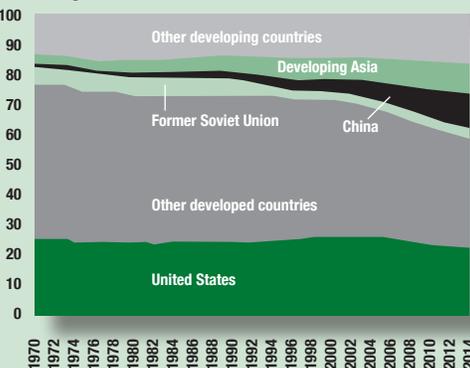
Developing regions account for growing share of global income

Developing regions account for an increasing share of global gross domestic product (GDP) — a measure of total economic output — a trend that reflects their growing role in driving growth in consumer demand, including demand for agricultural products. Relatively high rates of GDP growth in developing regions, particularly China and other developing Asian countries, have boosted the developing country share of global GDP from 21% in 1990 to 27% in 2000, and about 38% in 2014, according to the Economic Research Service of the U.S. Department of Agriculture.

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Regional shares of global gross domestic product (GDP)

Percent of global GDP



Note: Developing Asia is Asia less Japan and China.
Source: USDA, Economic Research Service using International Monetary Fund data.

Current farmland markets viewed in a longer-term context

by Bruce J. Sherrick, Ph.D., University of Illinois

Farmland values have experienced double digit annual rates of increase in recent years as incomes have been high and interest rates generally low. During 2014, a wide section of the Midwest experienced perhaps the best growing conditions in history, even as drought pressured California agriculture. The anticipated record corn and soybean harvests weighed on prices, with lower commodity prices bringing relief to livestock and export markets. The falling commodity prices resulted in lower income projections by many, and questions ensued about the sustainability of farmland prices and the potential for a correction, along with pressures to revisit rental arrangements.

This is good time to take a longer-term perspective to sense the market currents relative to the longer-term environment. Some important issues distinguish today's farmland market from past markets. In addition, short-term and longer-term perspectives differ, just as today's weather and the local climate differ. Weather refers to current and near-term environmental conditions. Climate describes the long-term proportions of alternative weather outcomes for a given location.

Farmland prices can generally be viewed as the capitalized value of future expected income. While current conditions affect expectations somewhat, markets don't completely adopt each outcome as an estimate of future conditions. That is, farmland investors recognize that recent income levels were likely high and that a single year's outcome, such as 2014, represents an outcome, not a fully changed condition or estimate of all future conditions. While interest rates and associated capitalization rates for future income may not be at typical multiples, the levels are by definition rational, given current macro conditions.

To share the longer-term perspective, a "story in pictures" follows regarding the climate for farmland markets.

Interest Rates & Lending Conditions

Today's interest rates and lending conditions are clearly different from the early 1980s. **Figure 1** (next page) shows the average new farm-mortgage interest rate as reported in the quarterly *AgLetter Survey* of the Chicago Federal Reserve and the 10-year constant maturity treasury interest rate.

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In round values, farm mortgage interest rates peaked in the 1980s at nearly 17.5% and were commonly made with up to 80% loan-to-value ratios. A 15% mortgage for 80% value would require over 12% of the asset's original value in cash flow just to service the loan with any amortized principal.

As seen in the data, the "spread over treasuries" provides one indicator of the perceived risk cost and spread over funding costs. The farm mortgage spreads averaged just over 2.25% for most of the period after the 1980s crisis, which is higher than during the pre-crisis era of less than 2%. Current mortgage markets for agricultural land carry terms of roughly 5% on loan-to-values of 60% or less and for substantially shorter terms. Thus, in contrast, about 3% of the asset value is required in cash flow to service a comparable loan today.

Leverage

Leverage has declined dramatically since the early 1980s, rendering the sector as a whole less vulnerable to collateral revaluation. As shown in **Figure 2**, the sector has very low aggregate leverage. In comparison, companies traded on the New York Stock Exchange, in aggregate, average about 65% debt. An implication is that more of a "buffer" is built into current holdings compared to 1980 holdings for asset revaluations to trigger a sell-off or for a liquidation response to approach zero equity.

Sector Income Levels

It is well-accepted that asset values reflect market expectations regarding future income. In the case of farm real estate, for several recent years incomes have been higher than the historic average, which raises questions about the ability of farmland to continue generating at these income levels. **Figure 3** offers context. The aggregate values may not represent individual farm cases well, but the point is that even substantial reductions against recent sector incomes bring us to levels that are unlikely to represent extremely low incomes for the sector. Regardless, the general pattern and levels of income through time remain important, whatever the cause and potential effect.

Crop Insurance

The nature of crop insurance has changed dramatically since the 1980s along with the ability of insurance to reduce income variability and shortfalls in poor production years. With early crop insurance, producers could effectively buy only 65% yield insurance, however, indemnity prices did not always meet market prices for outputs.

In contrast, today most farmers — roughly 80% of commercial production — purchase revenue insurance with coverage of up to 85% indexed to current market prices and with the option to increase the guaranteed revenue if futures prices increase.

The downside risk has been substantially altered with today's improved crop insurance products, and coverage is nearly complete in important production regions. An important implication is that today producers can put a floor under losses and can reliably address risks associated with farmland cash rents, an analog of income to the asset.

Figure 1. Farm Mortgage Interest rates and funding indicators (Chicago Federal Reserve, FED H.15)

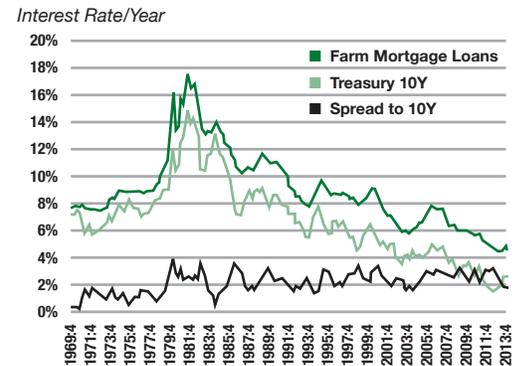


Figure 2. Aggregate Debt Ratios, U.S. Ag Sector (U.S. Dept. of Ag.)

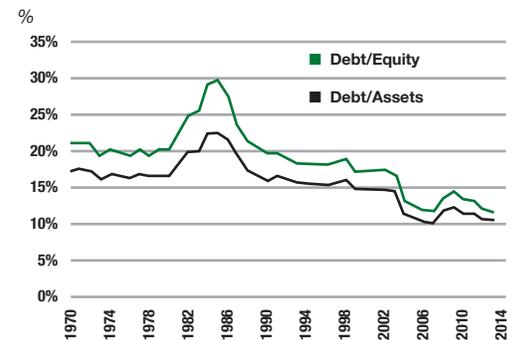
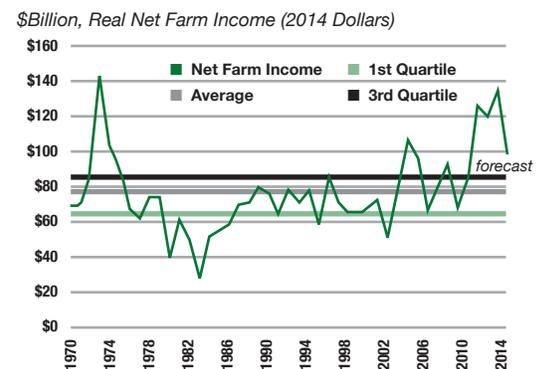
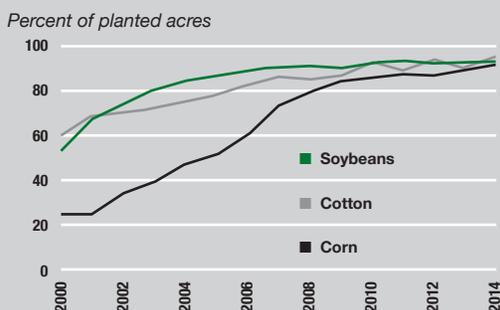


Figure 3. Ag Sector Income Characteristics (sources: USDA and Bureau of Labor Statistics, Consumer Price Index deflators)



Genetically engineered seeds planted on over 90% of U.S. corn, cotton and soybeans

Adoption of genetically engineered crops in the United States, 2000–14



U.S. farmers have adopted genetically engineered (GE) seeds in the 19 years since their commercial introduction, despite their typically higher seed prices, according to the Economic Research Service of the U.S. Department of Agriculture.

Herbicide-tolerant (HT) crops, developed to survive the application of specific herbicides that previously would have destroyed the crop along with the targeted weeds, provide

farmers with a broader variety of options for weed control. Insect-resistant crops contain a gene from the soil bacterium Bt (*Bacillus thuringiensis*) that produces a protein toxic to specific insects, protecting the plant over its entire life. "Stacked" seed varieties carry both HT and Bt traits and now account for a large majority of GE corn and cotton seeds.

In 2014, adoption of GE varieties,

Implied Capitalization Rate

Figure 4 summarizes information from related income and interest rate series to create an implied capitalization (Cap) rate. Cash rent is divided by the value of the asset that generated the income and is compared to the constant maturity 10 year treasury yield (CMT-10y). While Illinois is used as an example, the graph would be representative of most U.S. production regions.

An alternative view is provided by capitalizing the cash rent by the 10-yr constant maturity treasury. This shows what the asset value would be if each period's income were viewed by markets to be a measure of all future income potential. **Figure 5** provides a fairly remarkable insight: that the period of the early 1980s had the largest divergence between the fundamental and actual values observed.

In contrast, the 2014 incomes were apparently not viewed as completely permanent in the market as the actual values did not move as high as would have been implied by a direct capitalization argument. Importantly, this analysis is very crude and very sensitive to the capitalization rate, especially at low levels.

Price Per Acre & Income

This brings us to the final and most cautionary graph. **Figure 6** shows the relationship between asset value (price per acre) and the corresponding income at alternative capitalization rates. The three cases shown depict farmland rented at \$200, \$300, or \$400 per acre. Under a 3% "cap rate," land that generates \$300 per acre per year has an equilibrium value of \$10,000/acre.

Most importantly, the relationship is incredibly sensitive at today's low capitalization rates. The drop in value if rates moved from 3% to 4%, for example, are far more significant than if rates moved from 9% to 10%, even though each move is a 1% interest rate increase. The increased sensitivity potential is noteworthy even though most economists do not anticipate a radical and immediate increase in cap rates nor a complete congruence between treasury rate movements and cap rate movements.

As always, substantial risks face agriculture and the markets for assets used in agricultural production. Recent agricultural conditions have led to somewhat more cautious examinations of asset values, yet:

- Income expectations remain reasonable and fairly stable.
- Debt rates are low, and interest rates are historically low which provides a buffer against potential asset revaluations.
- Crop insurance developments have fundamentally altered the riskiness of income and virtually eliminated the usage of ad hoc disaster assistance programs.
- Important adjustments in any market remain possible as individuals refine and adjust their understanding of the factors influencing future income potential.

May this "story in pictures" add to the accuracy of the understanding of agricultural farmland markets and provide a useful longer-term context in which to evaluate an investment in farmland.

Note: The views expressed herein are solely the author's opinions and do not necessarily reflect those of entities with whom he is professionally affiliated.

Figure 4. Implied Capitalization rate for Farmland and 10-yr. CMT (USDA, Fed H.15)

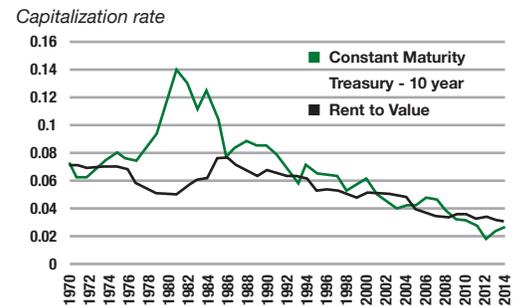


Figure 5. Actual values and capitalized rents

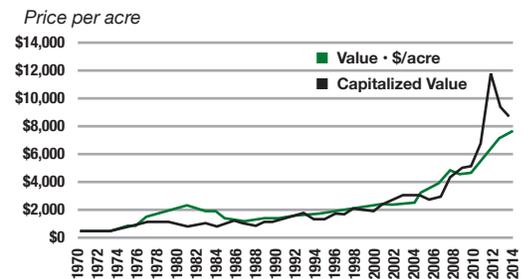
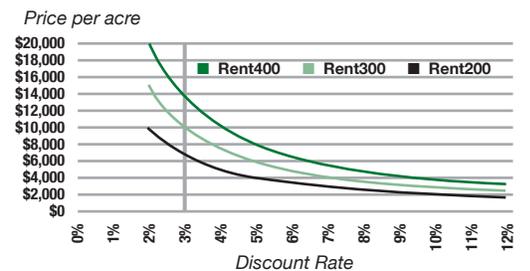


Figure 6. Relationship between rental income, capitalization rate, and asset values



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an acres

including those with herbicide tolerance, insect resistance, or stacked traits, reached 96% of cotton acreage, 94% of soybean acreage (soybeans have only HT varieties), and 93% of corn acreage planted in the United States.

Note: Data for each crop include varieties with herbicide tolerance, insect resistance, or both ("stacked") traits. Data collected for calendar year plantings.

Source: USDA, Economic Research Service using data from USDA, National Agricultural Statistics Service, June Agricultural Survey.

Developing regions continued from page 1

This ongoing shift in the world economy is a driver of food demand because developing country consumers tend to spend larger shares of additional income on food. China and Developing Asia together accounted for 34% of U.S. agricultural exports in fiscal 2013, while developing countries as a whole accounted for 65%. USDA long-term projections for agriculture, which assume continued income growth in developing countries, indicate that developing countries will account for more than 90% of the growth in world imports of meats, grains, and oilseeds over the next decade.

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