THE Main Street ECONOMIST
Agricultural and Rural Analysis

Issue 5, 2011 | Federal Reserve Bank of Kansas City

Is This Farm Boom Different?

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U.S. agriculture is notorious for its "golden eras." During the 1910s, sparked by rising export demand during World War I, U.S. farmers enjoyed surging incomes that quickly translated into rapid farmland price appreciation. During the 1970s, surging export activity triggered another spike in U.S. farm incomes and farmland values. These golden eras, however, were soon tarnished as economic and financial market conditions changed.

Today, U.S. agriculture appears to be in the midst of another golden era. Robust export activity, strong bio-fuels demand and low interest rates have spurred another farm income and farmland value boom. Despite the vast similarities to past booms, subtle differences suggest that this time could be different.

This article will explore the foundations of the current and past farm booms. In all cases, strong global demand outstripped agricultural supplies to boost farm incomes, and low interest rates quickly capitalized rising incomes into record farmland prices. Yet, the current period of prosperity is different as farmers have not used debt to expand their capital expenditures at the pace of past farm booms. The avoidance of excessive capital investment and leverage may be one of the lessons learned from previous golden eras. The question remains, however, whether this will be enough to alter agriculture's boom and bust cycle.

> *"History has shown that golden eras fade and that farm corrections devolve into farm busts in highly leveraged environments."*

Agriculture's Golden Eras

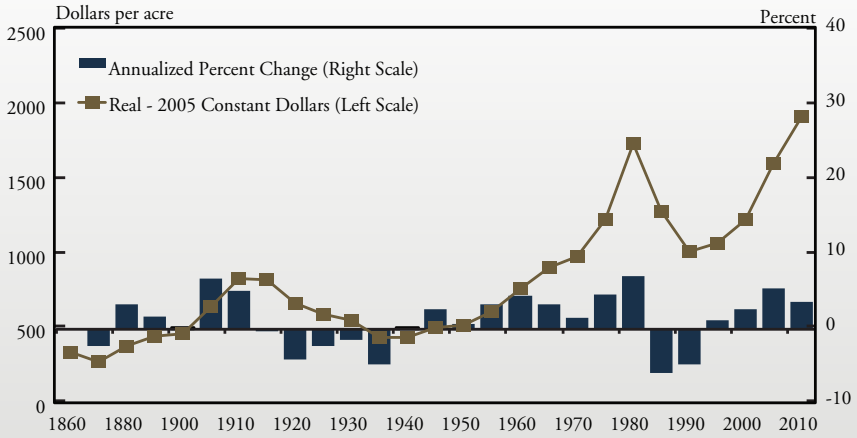
In the 20th century, U.S. agriculture enjoyed two golden eras. In the 1910s and the 1970s, strong global demand and rising exports boosted agricultural commodity prices and farm incomes. With low interest rates, rising farm incomes sparked stronger capital investments in land and machinery. These periods of prosperity, however, were not sustained as both decades were followed by severe contractions in farm income and farmland values.

World War I ushered in U.S. agriculture's first golden era of farm prosperity in the 20th century (Paarlberg and Paarlberg). In the

second half of the 1910s, U.S. exports rose sharply to meet war–time demand for food, and agricultural commodity prices doubled. With strong agricultural prices, after adjusting for inflation, the real returns to operators jumped 60 percent in 1917 and remained high through 1919.[1] Simultaneously, low interest rates helped farmers accelerate their capital investments and quickly capitalize surging incomes into farmland values. Between 1900 and 1919, real farmland values in the U.S. rose more than 70 percent, especially in the nation's Corn Belt (Chart 1).

The century's second golden era emerged in the 1970s, when farmland prices soared again. During the 1970s, President Nixon's trade missions to Russia and China prompted a surge in agricultural exports. After two decades of relatively stable prices, the real value of U.S. exports doubled and agricultural crop prices and farm profits spiked between 1971 and 1973. Plummeting demand during the 1975-76 recession erased the gains in farm profits. Yet, with stronger global economic growth and a rebound in agricultural trade, farm profits recovered to reach near record highs by the end of the decade. Simultaneously, real interest rates turned negative, which kept debt service costs low and triggered a surge in equipment spending and a farmland price boom. During the 1970s, real U.S. farmland values soared almost 80 percent, reaching record highs in 1981.

Chart 1
U.S. Farm Real Estate Values



Source: USDA

The Golden Eras Fade

In both cases, the booming prosperity of the farm economy soon faded. Once promising export demand began to wane, and agricultural supplies soared as previous capital investments expanded agricultural production capacity. In addition, interest rates rose sharply, limiting the capitalization of lower incomes into farmland prices.

After World War I, U.S. agricultural profits fell sharply as global demand dwindled amid larger supplies. Agricultural exports retreated at the conclusion of the war, and war-related food demand disappeared with rebounding global food production. At the same time, capital investments during the previous decade expanded agricultural production capabilities. For example, the adoption of the tractor increased the land available for human food production, as less feed was needed for draft animals. The combination of weaker demand and burgeoning supplies cut U.S. crop prices, and returns to operators plummeted by more than 60 percent between 1919 and 1921 (Chart 2).

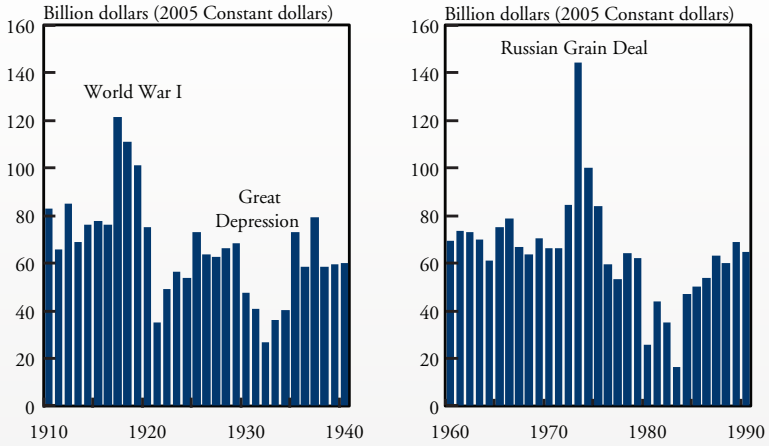
At the same time, real interest rates rose, which limited the capitalization of income into farmland prices. The Federal Reserve increased interest rates starting in 1920 to control inflationary pressures that were building during the war (Chart 3). A U.S. recession ensued, which

curtailed agricultural demand even further. Weaker profits and higher real interest rates in the 1920s cut the average farmland value almost 30 percent between 1916 and the mid-1920s. By the end of the Great Depression in the 1930s, the value of U.S. farmland had dropped 66 percent from its record highs, retreating to the level at the beginning of the century.

A similar story emerged in the 1980s (Peoples et. al). After peaking in 1981, trade disruptions, such as an embargo on Russian grain exports, and a strengthening in the value of the dollar cut agricultural exports by 60 percent within 5 years. In addition, agricultural production increased as farmers planted "fence row-to-fence row," and research and development investments in farm equipment and genetics in the 1970s led to increased yields and bigger production. By 1983, returns to operators were only 25 percent of the 1970s high as profits were squeezed by shrinking cash receipts and higher production costs from oil price shocks.

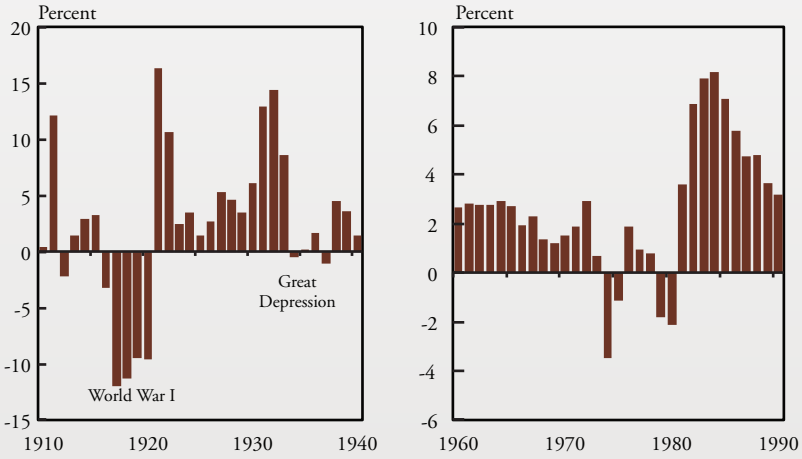
In the 1980s, real interest rates rose sharply as the Federal Reserve sought to control the inflationary pressures that had developed during the previous decade. With shrinking profits and higher real interest rates, capital investments in agriculture plummeted and farm bankruptcies

Chart 2
Returns to Farm Operators



Calculations based on USDA data

Chart 3
Real Interest Rates on U.S. Treasuries



Calculations based on Department of Treasury and Bureau of Labor Statistics data
Real interest rate equals the nominal interest rate on a 10 year treasury minus the 12 month percent change on the CPI index.

soared. After peaking in 1981, the average value of farmland dropped more than 40 percent by 1987, returning to 1960s levels.

Is Today's Boom Different?

In many respects, today's farm boom is quite similar to past eras of farm prosperity. Global demand for agricultural products is strong. Agricultural supplies are tight. Low interest rates are supporting the capitalization of rising incomes into farmland values. Still, farmers have yet to use debt to pay for investments in land, equipment, and machinery on the scale of past farm booms.

Market and financial conditions have underpinned wide swings in U.S. agricultural profits throughout the past decade. In four of the past 10 years, real net farm income jumped more than 25 percent, while in three of those years, income plummeted more than 20 percent.[2] Despite the volatility in income, many farmers have enjoyed stronger profitability in recent years. For the second consecutive year, U.S. real net farm income in 2011 surged almost 30 percent, with stronger profits for many crop and livestock producers.

Similar to past farm booms, robust global demand that strained current production levels has been one cornerstone of the current level of prosperity. Spurred by rising incomes in developing countries, such as China, U.S. agricultural exports could reach a record high in 2011, topping $130 billion, double 2005 levels. Heading into the fourth quarter of 2011, crop and livestock exports jumped more than 35 and 25 percent above previous year levels, respectively.[3] Projections of additional gains in both population and income in developing nations underpin bullish expectations for agricultural commodities into the future.

In addition, ethanol production has underpinned the recent boom in farmland markets. While the ethanol industry struggled to fulfill the 2007 renewable fuel mandates in its initial years, surging ethanol prices and profits enticed a major expansion of the industry. By 2011, ethanol production capacity stretched above mandated levels and used roughly 40 percent of the U.S. corn crop.[4] Recent studies suggest the mandate contributes as much as $2 per bushel to the price of corn when crude oil prices fall below $100 per barrel (Babcock). During the past year, record high sugar prices raised the production costs of Brazilian ethanol and allowed U.S. corn based ethanol to compete in global markets. In fact, the U.S. emerged as a net exporter of ethanol in 2010.

Strong global food and fuel demand strained existing inventories of agricultural products, which sent agricultural prices soaring. Over the past year, extreme weather conditions, ranging from drought in Russia and the southern U.S. to flooding in the U.S. Corn Belt, have limited crop and livestock production. Combined with robust demand, world grain supplies have fallen to historical lows with U.S. corn supplies at less than 10 percent of its annual use. In the livestock sector, global meat production has struggled to keep up with world demand, and prices for cattle, hogs, and milk have soared to record highs. For U.S. producers, the prices received from crop and livestock products have risen more than 35 and 17 percent, respectively, over the past year.[5]

At the same time, low interest rates have fostered the capitalization of these bumper profits into record high farmland values. Accommodative policies by the Federal Reserve have pushed short- and longer-term interest rates to historical lows. The capitalization of incomes into farmland values has accelerated with land value gains outpacing the rise in cash rents. In fact, the average farmland value to cash rent multiple, which is similar to a price-to-earnings ratio on a stock, surged to a record high of almost 30 in various Corn Belt states (Gloy et. al).[6]

Despite the similarities in broader

market and financial conditions, ***farm capital investments*** are a striking difference between current and past farm booms. In contrast to past farm booms, non-real-estate investments in agriculture have not soared to the highs of previous farm booms. In addition, farmers have not used debt to fuel their capital investments.

With rising profits, farmers often expand their capital investments. During past farm booms, farmers invested heavily into equipment, machinery, structures (grain bins and machine sheds) land improvements (irrigation systems and tile lines) and other types of capital expenditures. During the 1970s, annual farm capital expenditures surged 71 percent, as farmers tripled their capital spending on tractors, farm buildings, and land improvements (Chart 4). Even in 1919, U.S. farmer more than tripled their spending on tractors and farm buildings when compared to pre-World War I highs.

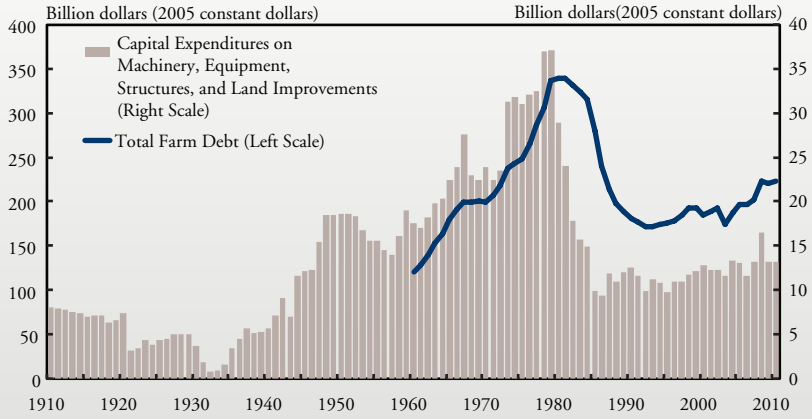
The 1970s surge in farm capital spending outstripped farm income gains and farmers used debt to pay for the investment boom. Historically farm capital expenditures average roughly 30 percent of net farm income. By 1977, capital expenditures on equipment, machinery, structures, and land improvements jumped to almost 80 percent of net farm income. With sluggish income growth and negative real interest rates slashing debt service costs, farmers leveraged their businesses to pay for investments in land, equipment and machinery. During the decade, U.S. real farm debt rose 70 percent, with larger gains emerging in non-real-estate debt. The biggest gains emerged between 1975 and 1980 when farm capital expenditures rose faster than net farm incomes.

The debt accumulation of the 1970s contributed to the economic calamity of the 1980s when interest rates surged. By 1982, when interest rates spiked as the Federal Reserve tightened monetary policy to combat inflation, farmers had more debt than they had capacity to service with their existing cash flows. The result was a farm financial crisis, a rise in farm bankruptcies and the 1980s farm bust.

Unlike the 1970s, farmers today have been more restrained in their capital investments. To be sure, capital expenditures have risen sharply, but they have increased at roughly the same rate as farm profits. In 2010, four-wheel drive tractor sales jumped almost 30 percent, on par with the gains in real net farm income. Yet, in 2011, despite a 28 percent rise in U.S. net farm income, tractor and combine sales have held steady. As a result, the ratios of farm capital expenditures to net income remained stable over the past two years, as it has, over the past decade.

In addition, U.S. farm debt has not soared as it did during the 1970s. The primary lenders to U.S. agriculture, commercial banks and

Chart 4
U.S. Farm Capital Expenditures and Farm Debt



Source: USDA

Issue 5, 2011 Federal Reserve Bank of Kansas City

Farm Credit Associations, report limited expansions in farm lending. According to Call Report data, farm debt outstanding at commercial banks has held steady since 2009 (Henderson and Akers). The Federal Farm Credit Banks Funding Corporation indicates that lending on real estate mortgages, production and other intermediate loans by Farm Credit System institutions have risen a modest 3.0 percent during the past year.

A lingering concern, however, is whether farmers will limit their capital expenditures and debt in future years. Agricultural advocates often tout that rising populations and a burgeoning middle class in developing nations will drive additional demand and profits for agriculture into the indefinite future (Penn). These expectations combined with historically low interest rates could ultimately entice farmers to expand their capital investments to seize emerging opportunities.

Yet, capital investments also depend on new technological innovations. In the 1910s, the tractor was a relatively new invention, and soaring agricultural profits accelerated its adoption into American agriculture. In the 1970s, technologies, such as four-wheel drive capabilities and increased horsepower, increased the capital investment in equipment and machinery. If farmers undertake another tidal wave of farm capital investments, a new path-breaking technology will need to revolutionize agriculture.

Conclusion

U.S. agriculture appears to be in the midst of another golden era. Strong global food demand and robust bio-fuels markets have strained current production capabilities of global agriculture. The prospects of tight global supplies well into the future have spurred booming farm incomes. Historically low interest rates have quickly capitalized these burgeoning incomes into record high farmland values.

Past golden eras quickly faded. The promises of sustained global demand shifted with economic conditions, and the capital investments in agriculture led to increased agricultural supplies that trimmed farm prices and incomes. At the same time, leaner farm incomes were unable to support the record-high farmland values, especially at higher interest rates. As a result, many farmers that worked to seize the emerging opportunities were left empty-handed as market and financial conditions changed.

While current conditions appear to be following the rhythms of the past, there is at least one distinct difference—capital investments. With rising incomes and low interest rates, farmers are making significant capital expenditures on equipment, machinery, structures and land improvements. Yet, many farmers have not used excessively high levels of debt to finance capital investments. History has shown that golden eras fade and that farm corrections devolve into farm busts in highly leveraged environments. Will checking farm debt and capital spending be enough to keep any correction in agricultural profits from spiraling into a farm bust?

Endnotes

[1]In this article, all nominal prices, income and farmland values were deflated to 2005 constant dollars.

[2]Calculations based on U.S. Department of Agriculture data on real net farm incomes *www.ers.usda.gov/Data/FarmIncome/Finfidmu.htm*

[3]U.S. agricultural trade data through August 2011 obtained from the Foreign Agricultural Service (FAS), USDA.

[4]Ethanol's corn usage of 40 percent excludes adjustments associated with the use of distilled grains in animal feed

[5]Calculations are based on the year-to-date prices received by farmers through October reported by the National Agricultural Statistical Service (NASS), USDA.

[6]Conversely, a multiple of 30 indicates that rent-to-value ratios on Corn Belt farmland have fallen to less than 4 percent.

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